2019 Annual Groundwater Monitoring and Corrective Action Report

Nelson Dewey Generating Station Slag Pond
Cassville, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25219071.00 | January 31, 2020

2830 Dairy Drive
Madison, WI 53718-6751
608-224-2830

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1.0 INTRODUCTION

This 2019 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the Coal Combustion Residuals (CCR) Rule [40 CFR 257.50-107]. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90(e). The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2019 Annual Groundwater Monitoring and Corrective Action Report for the CCR Unit.

This report covers the period of groundwater monitoring from January 1, 2019, through December 31, 2019.

The system is designed to detect monitored constituents at the waste boundary of the Slag Pond (existing CCR surface impoundment) located at Nelson Dewey Generating Station (NED), as required by 40 CFR 257.91(d). The groundwater monitoring system consists of one upgradient and six downgradient monitoring wells.

During 2017 and early 2018, the Slag Pond CCR unit was closed by leaving the CCR in place and installing a final cover system, in accordance with §257.102(d). Closure certification was completed on January 31, 2018.

2.0 § 257.90(E) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. *For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:*

2.1 §257.90(E)(1) SITE MAP

A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

A map showing the site location is provided as **Figure 1**. A map showing the CCR unit and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided as **Figure 2**. The Slag Pond CCR unit is closed, and the map shows the post-closure conditions.

2.2 §257.90(E)(2) MONITORING SYSTEM CHANGES

Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

No new monitoring wells were installed and no wells were decommissioned as part of the groundwater monitoring program for the CCR unit in 2019.

2.3 §257.90(E)(3) SUMMARY OF SAMPLING EVENTS

In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

Two groundwater sampling events were completed in 2019 at the NED Slag Pond as part of ongoing detection monitoring.

Groundwater samples collected during the semiannual events, in April and October 2019, were analyzed for the Appendix III constituents. A summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring program is included in Table 1. The results of the analytical laboratory analyses are provided in the laboratory reports in Appendix A1 and Appendix A2.

2.4 § 257.90(E)(4) MONITORING TRANSITION NARRATIVE

A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels);

There were no transitions between monitoring programs in 2019. The NED Slag Pond remained in the detection monitoring program.

In 2019, the monitoring results for the October 2018 and April 2019 monitoring events were evaluated for statistically significant increases (SSIs) in detection monitoring parameters relative to background. For both events, SSIs for boron, chloride, fluoride, field pH, sulfate, and total dissolved solids (TDS) were identified; however, alternative source demonstrations (ASDs) were completed, demonstrating that a source other than the CCR unit was the likely cause of the observed concentrations. The ASD reports are provided in Appendix B.

2.5 § 257.90(E)(5) OTHER REQUIREMENTS

Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.

Additional potentially applicable requirements for the annual report, and the location of the requirement within the Rule, are provided in the following sections. For each cited section of the Rule, the portion referencing the annual report requirement is provided below in italics, followed by applicable information relative to the 2019 Annual Groundwater Monitoring and Corrective Action Report for the NED Slag Pond CCR unit.

2.5.1 § 257.90(e) General Requirements

For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year.

Status of Groundwater Monitoring and Corrective Action Program. The groundwater monitoring and corrective action program is currently in detection monitoring.

Summary of Key Actions Completed.

- Statistical evaluation and determination of SSIs for the October 2018 and April 2019 monitoring events.
- ASD reports for the SSIs identified from the October 2018 and April 2019 monitoring events.
- Two semiannual groundwater sampling and analysis events (April and October 2019), with no resampling events performed.

Description of Any Problems Encountered. No problems were encountered in 2019.

Discussion of Actions to Resolve the Problems. Not applicable.

Projection of Key Activities for the Upcoming Year (2020):

- Statistical evaluation and determination of any SSIs for the October 2019 and April 2020 monitoring events.
- If an SSI is determined, then within 90 days either:
  - Complete alternative source demonstration (if applicable), or
  - Establish an assessment monitoring program.
- Two semiannual groundwater sampling and analysis events (April and October 2020).

2.5.2 § 257.94(d) Alternative Detection Monitoring Frequency

The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable. No alternative detection monitoring frequency has been proposed.

2.5.3 § 257.94(e)(2) Alternative Source Demonstration for Detection Monitoring

The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

The ASD reports prepared to address the SSIs observed for the October 2018 and April 2019 sampling events are provided in **Appendix B**. The ASD reports are certified by a qualified professional engineer.

2.5.4 § 257.95(c) Alternative Assessment Monitoring Frequency

The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable. Assessment monitoring has not been initiated.

2.5.5 § 257.95(d)(3) Assessment Monitoring Results and Standards

Include the recorded concentrations required by paragraph (d)(1) of this section, identify the background concentrations established under § 257.94(b), and identify the groundwater protection standards established under paragraph (d)(2) of this section in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable. Assessment monitoring has not been initiated.

2.5.6 § 257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring

The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

Not applicable. Assessment monitoring has not been initiated.

2.5.7 § 257.96(a) Extension of Time for Corrective Measures Assessment

The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measure due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

Not applicable. Corrective measures assessment has not been initiated.

Table 1

CCR Rule Groundwater Samples Summary

Table 1. CCR Rule Groundwater Samples Summary
Nelson Dewey Generating Station Slag Pond / SCS Engineers Project #25219071.00

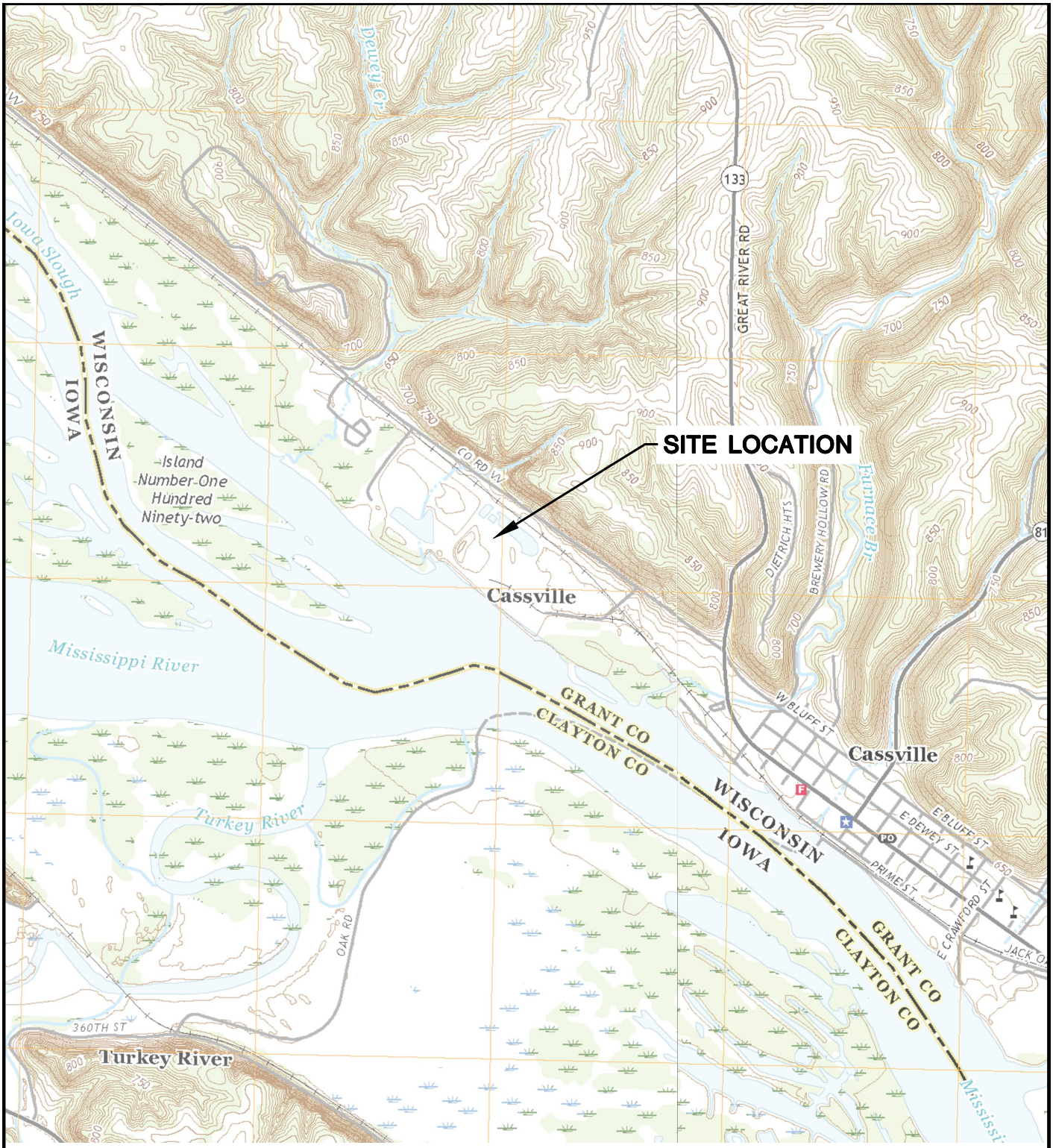
Sample Dates	Downgradient Wells						Background Well
	B-7R	B-11R	B-11A	B-11B	B-31R	B-31A	B-26
4/22-23/2019	D	D	D	D	D	D	D
10/14-15/2019	D	D	D	D	D	D	D
Total Samples	2	2	2	2	2	2	2

Abbreviations:
D = Required by Detection Monitoring Program
D-R = Detection Monitoring Resample for selected parameters only

Created by: ACW Date: 11/12/2019
Last revision by: ACW Date: 11/12/2019
Checked by: NDK Date: 1/3/2019

I:\25219071.00\Deliverables\2019 Federal Annual Report-NED\Tables\[Table 1 - 2019_GW_Samples_Summary_NED.xlsx]GW Summary

Figures



N

CASSVILLE AND TURKEY RIVER QUADRANGLES
WISCONSIN–IOWA
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'

CLIENT	ALLIANT ENERGY 4902 N. BILTMORE LANE, #1000 MADISON, WI 53718	SITE	ALLIANT ENERGY NELSON DEWEY GENERATING STATION CASSVILLE, WISCONSIN

SITE LOCATION MAP

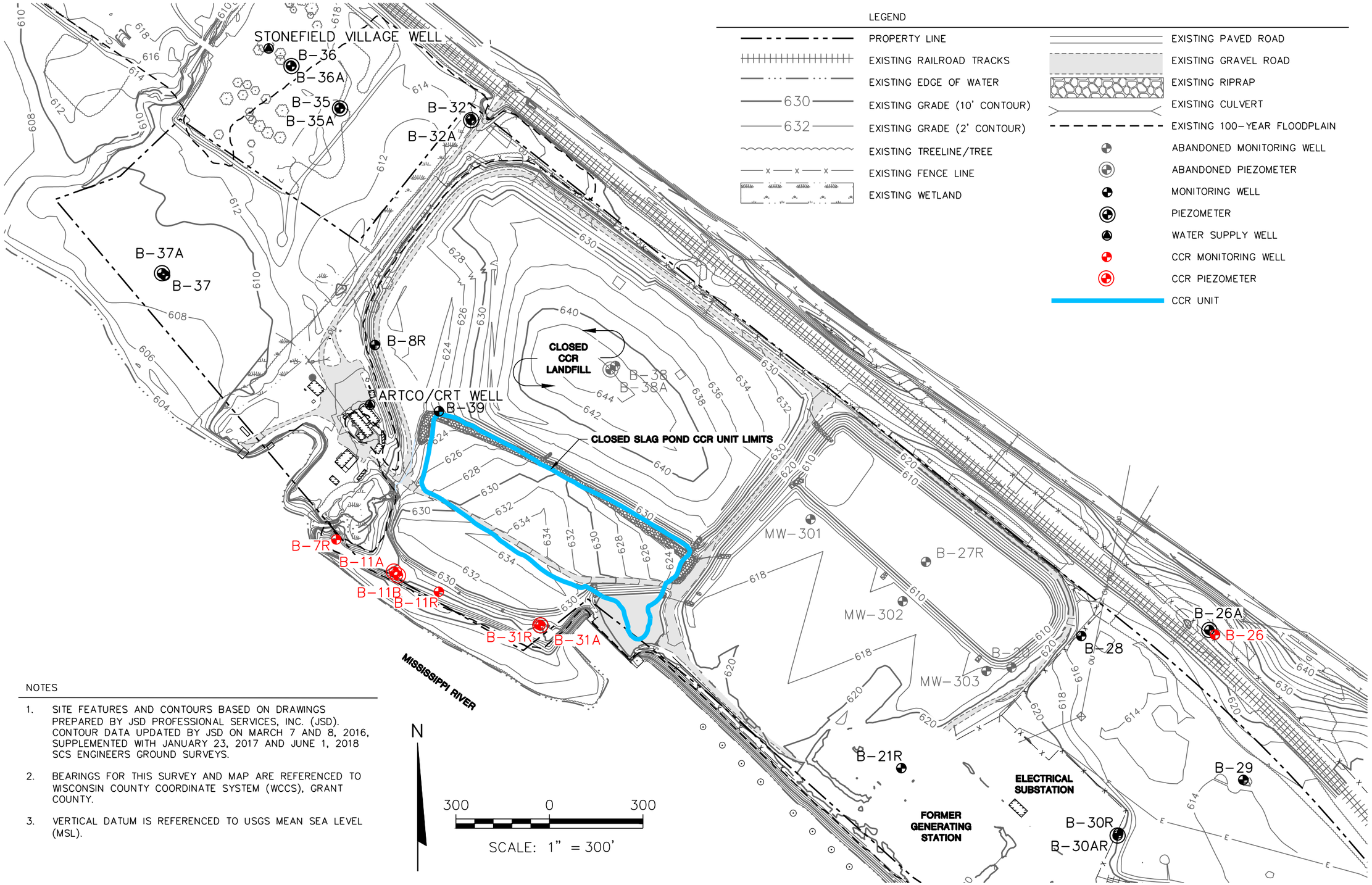
PROJECT NO.	25219071.00	DRAWN BY:	BSS
DRAWN:	11/27/2019	CHECKED BY:	MDB
REVISED:	01/14/2020	APPROVED BY:	TK 01/30/2020

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

FIGURE
1

I:\25219071.00\Drawings\CCR 2019 Annual Report\Site Location Map.dwg, 1/30/2020 3:49:13 PM



NOTES

1. SITE FEATURES AND CONTOURS BASED ON DRAWINGS PREPARED BY JSD PROFESSIONAL SERVICES, INC. (JSD). CONTOUR DATA UPDATED BY JSD ON MARCH 7 AND 8, 2016, SUPPLEMENTED WITH JANUARY 23, 2017 AND JUNE 1, 2018 SCS ENGINEERS GROUND SURVEYS.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), GRANT COUNTY.
3. VERTICAL DATUM IS REFERENCED TO USGS MEAN SEA LEVEL (MSL).

SITE PLAN AND MONITORING WELL LOCATIONS

ALLIANT ENERGY
NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

FIGURE 2

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

ENGINEER

DRAWN BY:	BSS
CHECKED BY:	MDB
APPROVED BY:	TK 01/30/2020

PROJECT NO.	25219071.00
DRAWN:	11/27/2019
REVISED:	01/14/2020

SITE

CLIENT
ALLIANT ENERGY
4902 N. BILTMORE LANE, #1000
MADISON, WI 53718

I:\25219071.00\Drawings\CCR 2019 Annual Report\Site Plan and Monitoring Well Locations.dwg, 1/30/2020 3:49:50 PM

Appendix A

Laboratory Reports

A1 April 2019 Detection Monitoring

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

May 08, 2019

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on April 25, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40186484001	**B-7R**	Water	04/22/19 15:20	04/25/19 08:50
40186484002	**B-11R**	Water	04/22/19 17:05	04/25/19 08:50
40186484003	**B-11A**	Water	04/22/19 14:50	04/25/19 08:50
40186484004	**B-11B**	Water	04/22/19 15:20	04/25/19 08:50
40186484005	**B-26**	Water	04/23/19 14:00	04/25/19 08:50
40186484006	**B-31R**	Water	04/22/19 16:30	04/25/19 08:50
40186484007	**B-31A**	Water	04/22/19 17:30	04/25/19 08:50
40186484008	**B-39**	Water	04/23/19 10:10	04/25/19 08:50
40186484009	**FIELD BLANK**	Water	04/23/19 10:10	04/25/19 08:50

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SAMPLE ANALYTE COUNT

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40186484001	**B-7R**	EPA 6020	KXS	2
			AXL	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40186484002	**B-11R**	EPA 6020	KXS	2
			AXL	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40186484003	**B-11A**	EPA 6020	KXS	2
			AXL	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40186484004	**B-11B**	EPA 6020	KXS	2
			AXL	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40186484005	**B-26**	EPA 6020	KXS	2
			AXL	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40186484006	**B-31R**	EPA 6020	KXS	2
			AXL	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40186484007	**B-31A**	EPA 6020	KXS	2
			AXL	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40186484008	**B-39**	EPA 6020	KXS	2
			AXL	7

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40186484009	**FIELD BLANK**	EPA 6020	KXS	2
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3

Pace Analytical Services, LLC
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(920)469-2436

ANALYTICAL RESULTS

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

Sample: B-7R **Lab ID: 40186484001** Collected: 04/22/19 15:20 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**93.5**	ug/L	11.0	3.3	1	04/26/19 07:00	04/26/19 22:29	7440-42-8	
Calcium	**59400**	ug/L	250	69.8	1	04/26/19 07:00	04/26/19 22:29	7440-70-2	
Field Data	Analytical Method:								
Field pH	**6.63**	Std. Units			1		04/22/19 15:20		
Field Specific Conductance	**603.7**	umhos/cm			1		04/22/19 15:20		
Oxygen, Dissolved	**0.17**	mg/L			1		04/22/19 15:20	7782-44-7	
REDOX	**-100.9**	mV			1		04/22/19 15:20		
Turbidity	**17.05**	NTU			1		04/22/19 15:20		
Static Water Level	**615.28**	feet			1		04/22/19 15:20		
Temperature, Water (C)	**10.5**	deg C			1		04/22/19 15:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**254**	mg/L	20.0	8.7	1		04/29/19 12:22		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**6.6**	Std. Units	0.10	0.010	1		04/29/19 13:40		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**10.9**	mg/L	10.0	2.5	5		04/30/19 17:30	16887-00-6	
Fluoride	**<0.50**	mg/L	1.5	0.50	5		04/30/19 17:30	16984-48-8	D3
Sulfate	**<5.0**	mg/L	15.0	5.0	5		04/30/19 17:30	14808-79-8	D3

Sample: B-11R **Lab ID: 40186484002** Collected: 04/22/19 17:05 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**1360**	ug/L	11.0	3.3	1	04/26/19 07:00	04/26/19 22:36	7440-42-8	
Calcium	**82400**	ug/L	250	69.8	1	04/26/19 07:00	04/26/19 22:36	7440-70-2	
Field Data	Analytical Method:								
Field pH	**6.82**	Std. Units			1		04/22/19 17:05		
Field Specific Conductance	**737**	umhos/cm			1		04/22/19 17:05		
Oxygen, Dissolved	**0.37**	mg/L			1		04/22/19 17:05	7782-44-7	
REDOX	**-20.9**	mV			1		04/22/19 17:05		
Turbidity	**8.88**	NTU			1		04/22/19 17:05		
Static Water Level	**615.28**	feet			1		04/22/19 17:05		
Temperature, Water (C)	**10.0**	deg C			1		04/22/19 17:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**406**	mg/L	20.0	8.7	1		04/29/19 12:23		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

Sample: B-11R **Lab ID: 40186484002** Collected: 04/22/19 17:05 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**6.9**	Std. Units	0.10	0.010	1		04/29/19 13:44		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**12.6**	mg/L	2.0	0.50	1		04/30/19 17:43	16887-00-6	
Fluoride	**0.20J**	mg/L	0.30	0.10	1		04/30/19 17:43	16984-48-8	
Sulfate	**34.6**	mg/L	3.0	1.0	1		04/30/19 17:43	14808-79-8	

Sample: B-11A **Lab ID: 40186484003** Collected: 04/22/19 14:50 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**93.9**	ug/L	11.0	3.3	1	04/26/19 07:00	04/26/19 22:43	7440-42-8	
Calcium	**60400**	ug/L	250	69.8	1	04/26/19 07:00	04/26/19 22:43	7440-70-2	
Field Data	Analytical Method:								
Field pH	**7.62**	Std. Units			1		04/22/19 14:50		
Field Specific Conductance	**721**	umhos/cm			1		04/22/19 14:50		
Oxygen, Dissolved	**0.07**	mg/L			1		04/22/19 14:50	7782-44-7	
REDOX	**218.3**	mV			1		04/22/19 14:50		
Turbidity	**0.00**	NTU			1		04/22/19 14:50		
Static Water Level	**615.29**	feet			1		04/22/19 14:50		
Temperature, Water (C)	**13.8**	deg C			1		04/22/19 14:50		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**386**	mg/L	20.0	8.7	1		04/29/19 12:23		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.7**	Std. Units	0.10	0.010	1		04/29/19 13:47		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**83.6**	mg/L	10.0	2.5	5		05/01/19 12:11	16887-00-6	
Fluoride	**0.29J**	mg/L	0.30	0.10	1		04/30/19 19:03	16984-48-8	
Sulfate	**1.9J**	mg/L	3.0	1.0	1		04/30/19 19:03	14808-79-8	

Sample: B-11B **Lab ID: 40186484004** Collected: 04/22/19 15:20 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**6830**	ug/L	220	66.0	20	04/26/19 07:00	04/30/19 07:28	7440-42-8	
Calcium	**83300**	ug/L	250	69.8	1	04/26/19 07:00	04/26/19 22:50	7440-70-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

ANALYTICAL RESULTS

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

Sample: B-11B **Lab ID: 40186484004** Collected: 04/22/19 15:20 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Field pH	**7.91**	Std. Units			1		04/22/19 15:20		
Field Specific Conductance	**1129**	umhos/cm			1		04/22/19 15:20		
Oxygen, Dissolved	**0.09**	mg/L			1		04/22/19 15:20	7782-44-7	
REDOX	**207.8**	mV			1		04/22/19 15:20		
Turbidity	**0.00**	NTU			1		04/22/19 15:20		
Static Water Level	**615.28**	feet			1		04/22/19 15:20		
Temperature, Water (C)	**13.6**	deg C			1		04/22/19 15:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**742**	mg/L	20.0	8.7	1		04/29/19 12:23		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.9**	Std. Units	0.10	0.010	1		04/29/19 13:49		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**28.4**	mg/L	2.0	0.50	1		04/30/19 19:16	16887-00-6	
Fluoride	**0.64**	mg/L	0.30	0.10	1		04/30/19 19:16	16984-48-8	
Sulfate	**303**	mg/L	30.0	10.0	10		05/01/19 12:24	14808-79-8	

Sample: B-26 **Lab ID: 40186484005** Collected: 04/23/19 14:00 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**41.6**	ug/L	11.0	3.3	1	04/26/19 07:00	04/30/19 07:35	7440-42-8	
Calcium	**75300**	ug/L	250	69.8	1	04/26/19 07:00	04/26/19 22:57	7440-70-2	
Field Data	Analytical Method:								
Field pH	**7.10**	Std. Units			1		04/23/19 14:00		
Field Specific Conductance	**815**	umhos/cm			1		04/23/19 14:00		
Oxygen, Dissolved	**8.73**	mg/L			1		04/23/19 14:00	7782-44-7	
REDOX	**259.9**	mV			1		04/23/19 14:00		
Turbidity	**0.00**	NTU			1		04/23/19 14:00		
Static Water Level	**615.49**	feet			1		04/23/19 14:00		
Temperature, Water (C)	**11.4**	deg C			1		04/23/19 14:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**458**	mg/L	20.0	8.7	1		04/30/19 16:13		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.4**	Std. Units	0.10	0.010	1		04/29/19 13:51		H6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

Sample: B-26 **Lab ID: 40186484005** Collected: 04/23/19 14:00 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**40.8**	mg/L	2.0	0.50	1		04/30/19 19:29	16887-00-6	
Fluoride	**<0.10**	mg/L	0.30	0.10	1		04/30/19 19:29	16984-48-8	
Sulfate	**26.7**	mg/L	3.0	1.0	1		04/30/19 19:29	14808-79-8	

Sample: B-31R **Lab ID: 40186484006** Collected: 04/22/19 16:30 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**906**	ug/L	55.0	16.5	5	04/26/19 07:00	04/30/19 07:42	7440-42-8	
Calcium	**105000**	ug/L	250	69.8	1	04/26/19 07:00	04/26/19 23:04	7440-70-2	
Field Data	Analytical Method:								
Field pH	**6.62**	Std. Units			1		04/22/19 16:30		
Field Specific Conductance	**827**	umhos/cm			1		04/22/19 16:30		
Oxygen, Dissolved	**0.10**	mg/L			1		04/22/19 16:30	7782-44-7	
REDOX	**94.2**	mV			1		04/22/19 16:30		
Turbidity	**0.00**	NTU			1		04/22/19 16:30		
Static Water Level	**615.01**	feet			1		04/22/19 16:30		
Temperature, Water (C)	**11.8**	deg C			1		04/22/19 16:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**516**	mg/L	20.0	8.7	1		04/29/19 12:23		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**6.8**	Std. Units	0.10	0.010	1		04/29/19 13:53		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**17.8**	mg/L	2.0	0.50	1		04/30/19 19:42	16887-00-6	
Fluoride	**0.16J**	mg/L	0.30	0.10	1		04/30/19 19:42	16984-48-8	
Sulfate	**121**	mg/L	15.0	5.0	5		05/01/19 12:37	14808-79-8	

Sample: B-31A **Lab ID: 40186484007** Collected: 04/22/19 17:30 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**86.2**	ug/L	11.0	3.3	1	04/26/19 07:00	04/30/19 07:49	7440-42-8	
Calcium	**48200**	ug/L	250	69.8	1	04/26/19 07:00	04/26/19 23:10	7440-70-2	
Field Data	Analytical Method:								
Field pH	**7.61**	Std. Units			1		04/22/19 17:30		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

Sample: B-31A **Lab ID: 40186484007** Collected: 04/22/19 17:30 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Field Specific Conductance	**517**	umhos/cm			1		04/22/19 17:30		
Oxygen, Dissolved	**0.13**	mg/L			1		04/22/19 17:30	7782-44-7	
REDOX	**-4.5**	mV			1		04/22/19 17:30		
Turbidity	**0.00**	NTU			1		04/22/19 17:30		
Static Water Level	**615.33**	feet			1		04/22/19 17:30		
Temperature, Water (C)	**13.9**	deg C			1		04/22/19 17:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**284**	mg/L	20.0	8.7	1		04/29/19 12:24		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.6**	Std. Units	0.10	0.010	1		04/29/19 13:56		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**40.8**	mg/L	2.0	0.50	1		04/30/19 19:55	16887-00-6	
Fluoride	**0.22J**	mg/L	0.30	0.10	1		04/30/19 19:55	16984-48-8	
Sulfate	**21.6**	mg/L	3.0	1.0	1		04/30/19 19:55	14808-79-8	

Sample: B-39 **Lab ID: 40186484008** Collected: 04/23/19 10:10 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**347**	ug/L	22.0	6.6	2	04/26/19 07:00	04/30/19 07:56	7440-42-8	
Calcium	**63600**	ug/L	250	69.8	1	04/26/19 07:00	04/26/19 23:17	7440-70-2	
Field Data	Analytical Method:								
Field pH	**6.98**	Std. Units			1		04/23/19 10:10		
Field Specific Conductance	**612.1**	umhos/cm			1		04/23/19 10:10		
Oxygen, Dissolved	**0.12**	mg/L			1		04/23/19 10:10	7782-44-7	
REDOX	**110.5**	mV			1		04/23/19 10:10		
Turbidity	**4.11**	NTU			1		04/23/19 10:10		
Static Water Level	**615.40**	feet			1		04/23/19 10:10		
Temperature, Water (C)	**13.5**	deg C			1		04/23/19 10:10		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**342**	mg/L	20.0	8.7	1		04/30/19 16:13		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.2**	Std. Units	0.10	0.010	1		04/29/19 14:02		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**0.65J**	mg/L	2.0	0.50	1		04/30/19 20:09	16887-00-6	

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ANALYTICAL RESULTS

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

Sample: B-39 **Lab ID: 40186484008** Collected: 04/23/19 10:10 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	**0.25J**	mg/L	0.30	0.10	1		04/30/19 20:09	16984-48-8	
Sulfate	**12.9**	mg/L	3.0	1.0	1		04/30/19 20:09	14808-79-8	

Sample: FIELD BLANK **Lab ID: 40186484009** Collected: 04/23/19 10:10 Received: 04/25/19 08:50 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**<3.3**	ug/L	11.0	3.3	1	04/26/19 07:00	04/26/19 20:12	7440-42-8	
Calcium	**<69.8**	ug/L	250	69.8	1	04/26/19 07:00	04/26/19 20:12	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<8.7**	mg/L	20.0	8.7	1		04/30/19 16:13		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.0**	Std. Units	0.10	0.010	1		04/29/19 14:06		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.50**	mg/L	2.0	0.50	1		04/30/19 20:22	16887-00-6	
Fluoride	**<0.10**	mg/L	0.30	0.10	1		04/30/19 20:22	16984-48-8	
Sulfate	**<1.0**	mg/L	3.0	1.0	1		04/30/19 20:22	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

QC Batch: 319546 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 40186484001, 40186484002, 40186484003, 40186484004, 40186484005, 40186484006, 40186484007, 40186484008, 40186484009

METHOD BLANK: 1856743 Matrix: Water
Associated Lab Samples: 40186484001, 40186484002, 40186484003, 40186484004, 40186484005, 40186484006, 40186484007, 40186484008, 40186484009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.3	11.0	04/26/19 19:58	
Calcium	ug/L	<69.8	250	04/26/19 19:58	

LABORATORY CONTROL SAMPLE: 1856744

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	500	451	90	80-120	
Calcium	ug/L	5000	4970	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1856745 1856746

Parameter	Units	40186447001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	39.3	500	500	483	482	89	88	75-125	0	20	
Calcium	ug/L	77400	5000	5000	87000	84200	192	137	75-125	3	20	P6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

QC Batch: 319740 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 40186484001, 40186484002, 40186484003, 40186484004, 40186484006, 40186484007

METHOD BLANK: 1858057 Matrix: Water
Associated Lab Samples: 40186484001, 40186484002, 40186484003, 40186484004, 40186484006, 40186484007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/29/19 12:21	

LABORATORY CONTROL SAMPLE: 1858058

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	577	564	98	80-120	

SAMPLE DUPLICATE: 1858060

Parameter	Units	40186484001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	254	248	2	10	

SAMPLE DUPLICATE: 1858061

Parameter	Units	40186338001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	702	698	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

QC Batch: 319950 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 40186484005, 40186484008, 40186484009

METHOD BLANK: 1858780 Matrix: Water
Associated Lab Samples: 40186484005, 40186484008, 40186484009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/30/19 16:12	

LABORATORY CONTROL SAMPLE: 1858781

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	577	578	100	80-120	

SAMPLE DUPLICATE: 1858782

Parameter	Units	40186448004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	408	414	1	10	

SAMPLE DUPLICATE: 1858783

Parameter	Units	40186454001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	304	288	5	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

QC Batch: 319709 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 40186484001, 40186484002, 40186484003, 40186484004, 40186484005, 40186484006, 40186484007, 40186484008, 40186484009

SAMPLE DUPLICATE: 1857968

Parameter	Units	40186273004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	20	H6

SAMPLE DUPLICATE: 1857969

Parameter	Units	40186329001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.6	0	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

QC Batch: 319630 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 40186484001, 40186484002, 40186484003, 40186484004, 40186484005, 40186484006, 40186484007, 40186484008, 40186484009

METHOD BLANK: 1857280 Matrix: Water
Associated Lab Samples: 40186484001, 40186484002, 40186484003, 40186484004, 40186484005, 40186484006, 40186484007, 40186484008, 40186484009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	2.0	04/30/19 10:00	
Fluoride	mg/L	<0.10	0.30	04/30/19 10:00	
Sulfate	mg/L	<1.0	3.0	04/30/19 10:00	

LABORATORY CONTROL SAMPLE: 1857281

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.9	100	90-110	
Fluoride	mg/L	2	2.0	99	90-110	
Sulfate	mg/L	20	20.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1857282 1857283

Parameter	Units	40186384003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	90.8	100	100	192	190	101	99	90-110	1	15	
Fluoride	mg/L	ND	10	10	9.8	9.9	94	96	90-110	2	15	
Sulfate	mg/L	ND	100	100	111	113	97	99	90-110	2	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1857284 1857285

Parameter	Units	40186484002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	12.6	20	20	33.5	33.6	104	105	90-110	0	15	
Fluoride	mg/L	0.20J	2	2	2.2	2.2	101	101	90-110	0	15	
Sulfate	mg/L	34.6	20	20	55.1	55.1	103	103	90-110	0	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219071 ALLIANT-NELSON DEWEY
Pace Project No.: 40186484

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40186484001	**B-7R**	EPA 3010	319546	EPA 6020	319610
40186484002	**B-11R**	EPA 3010	319546	EPA 6020	319610
40186484003	**B-11A**	EPA 3010	319546	EPA 6020	319610
40186484004	**B-11B**	EPA 3010	319546	EPA 6020	319610
40186484005	**B-26**	EPA 3010	319546	EPA 6020	319610
40186484006	**B-31R**	EPA 3010	319546	EPA 6020	319610
40186484007	**B-31A**	EPA 3010	319546	EPA 6020	319610
40186484008	**B-39**	EPA 3010	319546	EPA 6020	319610
40186484009	**FIELD BLANK**	EPA 3010	319546	EPA 6020	319610
40186484001	**B-7R**				
40186484002	**B-11R**				
40186484003	**B-11A**				
40186484004	**B-11B**				
40186484005	**B-26**				
40186484006	**B-31R**				
40186484007	**B-31A**				
40186484008	**B-39**				
40186484001	**B-7R**	SM 2540C	319740		
40186484002	**B-11R**	SM 2540C	319740		
40186484003	**B-11A**	SM 2540C	319740		
40186484004	**B-11B**	SM 2540C	319740		
40186484005	**B-26**	SM 2540C	319950		
40186484006	**B-31R**	SM 2540C	319740		
40186484007	**B-31A**	SM 2540C	319740		
40186484008	**B-39**	SM 2540C	319950		
40186484009	**FIELD BLANK**	SM 2540C	319950		
40186484001	**B-7R**	EPA 9040	319709		
40186484002	**B-11R**	EPA 9040	319709		
40186484003	**B-11A**	EPA 9040	319709		
40186484004	**B-11B**	EPA 9040	319709		
40186484005	**B-26**	EPA 9040	319709		
40186484006	**B-31R**	EPA 9040	319709		
40186484007	**B-31A**	EPA 9040	319709		
40186484008	**B-39**	EPA 9040	319709		
40186484009	**FIELD BLANK**	EPA 9040	319709		
40186484001	**B-7R**	EPA 300.0	319630		
40186484002	**B-11R**	EPA 300.0	319630		
40186484003	**B-11A**	EPA 300.0	319630		
40186484004	**B-11B**	EPA 300.0	319630		
40186484005	**B-26**	EPA 300.0	319630		
40186484006	**B-31R**	EPA 300.0	319630		
40186484007	**B-31A**	EPA 300.0	319630		
40186484008	**B-39**	EPA 300.0	319630		
40186484009	**FIELD BLANK**	EPA 300.0	319630		

REPORT OF LABORATORY ANALYSIS

Pace Analytical®
www.pacelabs.com

UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

Page 1 of

40186484

CHAIN OF CUSTODY

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

(Please Print Clearly)	
Company Name:	SCS Engineers
Branch/Location:	Madison
Project Contact:	Meg Blodgett
Phone:	
Project Number:	25219071
Project Name:	Alliant-Nelson Dewey
Project State:	WI
Sampled By (Print):	Paul Grover
Sampled By (Sign):	
PO #:	Regulatory Program:

Quote #:	
Mail To Contact:	
Mail To Company:	
Mail To Address:	
Invoice To Contact:	
Invoice To Company:	
Invoice To Address:	
Invoice To Phone:	

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☐ NOT needed on your sample

Matrix Codes

A = Air	W = Water
B = Biota	DW = Drinking Water
C = Charcoal	GW = Ground Water
O = Oil	SW = Surface Water
S = Soil	WW = Waste Water
SI = Sludge	WP = Wipe

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	FILTERED? (YES/NO)	PRESERVATION (CODE)*	Analyses Requested: B, Ca	TDS, Pk, SO4, F, Cl		CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
					Y/N	Pick Letter	No	No	No			
001	B-7R	4/23/19	15:20	GW		D	X	X	X		① Filled in by ALane, PC 4/25/19	
002	B-11R		17:05									
003	B-11A		14:50									
004	B-11B		15:20									
005	B-26	4/23/19	14:00									
006	B-31R	4/23/19	16:30									
007	B-31A		17:30									
008	B-39	4/23/19	10:10									
009	Field Blank	4/23/19	10:10	DI								

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):

Email #1:	
Email #2:	
Telephone:	
Fax:	

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
Paul A. Grover	4/24/19 15:00		
CS Logistics	4/25/19 0810	Paul By Paul	4/25/19 0810

PACE Project No.
40186484

Receipt Temp = 3 °C

Sample Receipt pH
OK / Adjusted

Cooler Custody Seal
Present / Not Present
Intact / Not Intact

C019a(27Jun2006)

Version 6.0 06/14/06

ORIGINAL

4018464

Table 2. Sampling Points and Parameters - CCR Rule Sampling Program Detection Monitoring
Groundwater Monitoring - Nelson Dewey Generating Station / SCS Engineers Project #25219071

100 mL/min

	Parameter	B7R	B11R	B11A	B11B	B26	B31R	B31A	B39	Field Blank	TOTAL
Appendix III Parameters	Boron	x	x	x	x	x	x	x	x	x	9
	Calcium	x	x	x	x	x	x	x	x	x	9
	Chloride	x	x	x	x	x	x	x	x	x	9
	Fluoride	x	x	x	x	x	x	x	x	x	9
	pH	x	x	x	x	x	x	x	x	x	9
	Sulfate	x	x	x	x	x	x	x	x	x	9
	TDS	x	x	x	x	x	x	x	x	x	9
Appendix IV Parameters	Antimony										0
	Arsenic										0
	Barium										0
	Beryllium										0
	Cadmium										0
	Chromium										0
	Cobalt										0
	Fluoride										0
	Lead										0
	Lithium										0
	Mercury										0
	Molybdenum										0
	Selenium										0
	Thallium										0
	Radium										0
Field Parameters	Groundwater Elevation	x	x	x	x	x	x	x	x		8
	Well Depth	x	x	x	x	x	x	x	x		8
	pH (field)	x	x	x	x	x	x	x	x		8
	Specific Conductance	x	x	x	x	x	x	x	x		8
	Dissolved Oxygen	x	x	x	x	x	x	x	x		8
	ORP	x	x	x	x	x	x	x	x		8
	Temperature	x	x	x	x	x	x	x	x		8
	Turbidity	x	x	x	x	x	x	x	x		8
	Color	x	x	x	x	x	x	x	x		8
	Odor	x	x	x	x	x	x	x	x		8

Notes:

I:\25219071.00\Data and Calculations\Field Work Requests\[WPL_ND_CCR_Rule_Sampling_Detection Monitorir

Pace Container Order #488428

40186484

Order By :		Ship To :		Return To:	
Company	SCS ENGINEERS	Company	SCS ENGINEERS (Pace Analytical	Company	Pace Analytical Green Bay
Contact	Blodgett, Meghan	Contact	Paul Grover	Contact	Milewsky, Dan
Email	mblodgett@scsengineers.com	Email	pgrover@scsengineers.com	Email	dan.milewsky@pacelabs.com
Address	2830 Dairy Drive	Address	2830 Dairy Drive	Address	1241 Bellevue Street
Address 2		Address 2		Address 2	Suite 9
City	Madison	City	Madison	City	Green Bay
State	WI Zip 53718	State	WI Zip 53718	State	WI Zip 54302
Phone	608-216-7362	Phone	608-216-7362	Phone	(920)469-2436

Info

Project Name	CCR Rule Alliant Nelson Dewey (25219071)	**Due Date**	04/18/2019	**Profile**	x	**Quote**	
Project	Milewsky, Dan	**Return**		**Carrier**	Most Economical	**Locatio**	

Trip Blanks

- [ ] Include Trip Blanks

Bottle

- [ ] Blank
- [ ] Pre-Printed No Sample IDs
- [x] Pre-Printed With Sample IDs

- [ ] Boxed Cases
- [ ] Individually Wrapped
- [x] Grouped By Sample

Return Shipping

- [ ] No Shipper
- [ ] With Shipper

COC Options

- [x] Number of Blanks: 1
- [ ] Pre-Printed

Misc

- [ ] Sampling Instructions
- [ ] Custody Seal
- [ ] Temp. Blanks
- [x] Coolers
- [ ] Syringes
- [ ] Extra Bubble Wrap
- [ ] Short Hold/Rush
- [x] DI: 1 Liter(s)
- [ ] USDA Regulated Soils

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
9	WT	Metals	250mL plastic w/HNO3	9	0	M-9-004-04BB	Boron/Calcium
9	WT	TDS, Cl, F, SO4	250ml plastic unpreserved	9	0	M-9-080-03BB	
9	WT	pH	250mL Plastic Unpreserved	9	0	M-9-080-03BB	

Hazard Shipping Placard In Place : NA

*Sample receiving hours are Monday through Friday 8:00 am to 6:00 pm and Saturday from 9:00 am to 12:00 pm unless special arrangements are made with your project manager.

*Pace Analytical reserves the right to return hazardous, toxic, or radioactive samples to you.

*Pace Analytical reserves the right to charge for unused bottles, as well as cost associated with sample storage and disposal.

*Payment term are net 30 days.

*Please include the proposal number on the chain of custody to insure proper billing.

Sample

ALL SAMPLES UNFILTERED

Ship Date : 04/17/2019

Prepared Mai Yer Her

Verified By:

Pace Analytical Services, LL
1241 Bellevue Street, Suite
Green Bay, WI 54302

Sample Preservation Receipt Form

Client Name: SCS Engineers Project # 40186484

All containers needing preservation have been checked and noted below: ☑Yes ☐No ☐N/A

Lab Lot# of pH paper: 10053581 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: JK Date/ Time:

Pace Lab #	Glass							Plastic							Vials						Jars			General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T	ZPLC	GN							
001											2		1																	X		2.5 / 5 / 10
002											2		1																	X		2.5 / 5 / 10
003											2		1																	X		2.5 / 5 / 10
004											2		1																	X		2.5 / 5 / 10
005											2		1																	X		2.5 / 5 / 10
006											2		1																	X		2.5 / 5 / 10
007											2		1																	X		2.5 / 5 / 10
008											2		1																	X		2.5 / 5 / 10
009											2		1																	X		2.5 / 5 / 10
010																																2.5 / 5 / 10
011																																2.5 / 5 / 10
012																																2.5 / 5 / 10
013																																2.5 / 5 / 10
014																																2.5 / 5 / 10
015																																2.5 / 5 / 10
016																																2.5 / 5 / 10
017																																2.5 / 5 / 10
018																																2.5 / 5 / 10
019																																2.5 / 5 / 10
020																																2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : ☐Yes ☐No ☑N/A ***If yes look in headspace column**

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3C	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	

1135

Pace Analytical 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 25Apr2018
	Document No.: F-GB-C-031-Rev.07	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project # WO#: 40186484

40186484

Client Name: SCS Engineers

Courier: ☑ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco ☐ Client ☐ Pace Other:

Tracking #: 2693 042419

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other

Thermometer Used SR - 38 **Type of Ice:** Wet Blue Dry None ☑ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 3 /Corr: 3

Temp Blank Present: ☐ yes ☑ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Person examining contents:
Date: 4/25/19
Initials: JK

Chain of Custody Present:	☑Yes ☐No ☐N/A	1. +CL 4/25/19 JK
Chain of Custody Filled Out:	☐Yes ☑No ☐N/A	2. No company Name, project state, mail/invoice, PO# 4/25/19 JK
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☑No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☑Yes ☐No 4/25/19 JK	6.
Rush Turn Around Time Requested:	☐Yes ☑No	7.
Sufficient Volume:		8.
For Analysis: ☑Yes ☐No MS/MSD:	☐Yes ☑No ☐N/A	
Correct Containers Used:	☑Yes ☐No	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☑N/A	
Containers Intact:	☑Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☐Yes ☑No ☐N/A	12. 008 I BP3U no date time, 009 - BP3U no time 4/25/19 JK
-Includes date/time/ID/Analysis Matrix: W		
Trip Blank Present:	☐Yes ☐No ☑N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: AL for DM **Date:** 4/25/19

A2 October 2019 Detection Monitoring

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

November 05, 2019

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on October 17, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40197444001	**B-7R**	Water	10/14/19 13:20	10/17/19 08:25
40197444002	**B-11A**	Water	10/14/19 14:30	10/17/19 08:25
40197444003	**B-11B**	Water	10/14/19 14:55	10/17/19 08:25
40197444004	**B-11R**	Water	10/14/19 14:45	10/17/19 08:25
40197444005	**B-31R**	Water	10/14/19 17:55	10/17/19 08:25
40197444006	**B-31A**	Water	10/14/19 18:30	10/17/19 08:25
40197444007	**B-39**	Water	10/15/19 08:55	10/17/19 08:25
40197444008	**B-26**	Water	10/15/19 10:15	10/17/19 08:25
40197444009	**FIELD BLANK**	Water	10/15/19 08:55	10/17/19 08:25

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40197444001	**B-7R**	EPA 6020	KXS	2
			HMG	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40197444002	**B-11A**	EPA 6020	KXS	2
			HMG	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40197444003	**B-11B**	EPA 6020	KXS	2
			HMG	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40197444004	**B-11R**	EPA 6020	KXS	2
			HMG	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40197444005	**B-31R**	EPA 6020	KXS	2
			HMG	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40197444006	**B-31A**	EPA 6020	KXS	2
			HMG	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40197444007	**B-39**	EPA 6020	KXS	2
			HMG	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40197444008	**B-26**	EPA 6020	KXS	2
			HMG	7

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40197444009	**FIELD BLANK**	EPA 6020	KXS	2
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

Sample: B-7R **Lab ID: 40197444001** Collected: 10/14/19 13:20 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**139**	ug/L	10.0	3.0	1	10/22/19 06:36	10/24/19 13:28	7440-42-8	
Calcium	**57700**	ug/L	254	76.2	1	10/22/19 06:36	10/24/19 13:28	7440-70-2	
Field Data	Analytical Method:								
Field pH	**6.62**	Std. Units			1		10/14/19 13:20		
Field Specific Conductance	**576.6**	umhos/cm			1		10/14/19 13:20		
Oxygen, Dissolved	**0.11**	mg/L			1		10/14/19 13:20	7782-44-7	
REDOX	**-132.2**	mV			1		10/14/19 13:20		
Turbidity	**4.25**	NTU			1		10/14/19 13:20		
Static Water Level	**613.43**	feet			1		10/14/19 13:20		
Temperature, Water (C)	**15.2**	deg C			1		10/14/19 13:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**208**	mg/L	20.0	8.7	1		10/21/19 18:13		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**6.9**	Std. Units	0.10	0.010	1		10/28/19 11:02		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**11.5**	mg/L	10.0	2.5	5		10/26/19 14:32	16887-00-6	
Fluoride	**<0.50**	mg/L	1.5	0.50	5		10/26/19 14:32	16984-48-8	D3
Sulfate	**<5.0**	mg/L	15.0	5.0	5		10/26/19 14:32	14808-79-8	D3

Sample: B-11A **Lab ID: 40197444002** Collected: 10/14/19 14:30 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**80.7**	ug/L	10.0	3.0	1	10/22/19 06:36	10/24/19 13:42	7440-42-8	
Calcium	**56600**	ug/L	254	76.2	1	10/22/19 06:36	10/24/19 13:42	7440-70-2	
Field Data	Analytical Method:								
Field pH	**7.66**	Std. Units			1		10/14/19 14:30		
Field Specific Conductance	**708**	umhos/cm			1		10/14/19 14:30		
Oxygen, Dissolved	**0.14**	mg/L			1		10/14/19 14:30	7782-44-7	
REDOX	**-59**	mV			1		10/14/19 14:30		
Turbidity	**2.58**	NTU			1		10/14/19 14:30		
Static Water Level	**613.29**	feet			1		10/14/19 14:30		
Temperature, Water (C)	**14.3**	deg C			1		10/14/19 14:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**348**	mg/L	20.0	8.7	1		10/21/19 18:14		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

Sample: B-11A **Lab ID: 40197444002** Collected: 10/14/19 14:30 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.8**	Std. Units	0.10	0.010	1		10/28/19 11:06		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**96.6**	mg/L	10.0	2.5	5		10/28/19 14:25	16887-00-6	
Fluoride	**0.26J**	mg/L	0.30	0.10	1		10/26/19 14:46	16984-48-8	
Sulfate	**<1.0**	mg/L	3.0	1.0	1		10/26/19 14:46	14808-79-8	

Sample: B-11B **Lab ID: 40197444003** Collected: 10/14/19 14:55 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**4630**	ug/L	10.0	3.0	1	10/22/19 06:36	10/24/19 13:48	7440-42-8	
Calcium	**91400**	ug/L	254	76.2	1	10/22/19 06:36	10/24/19 13:48	7440-70-2	
Field Data	Analytical Method:								
Field pH	**7.92**	Std. Units			1		10/14/19 14:55		
Field Specific Conductance	**1132**	umhos/cm			1		10/14/19 14:55		
Oxygen, Dissolved	**0.19**	mg/L			1		10/14/19 14:55	7782-44-7	
REDOX	**-48.9**	mV			1		10/14/19 14:55		
Turbidity	**1.50**	NTU			1		10/14/19 14:55		
Static Water Level	**613.18**	feet			1		10/14/19 14:55		
Temperature, Water (C)	**14.3**	deg C			1		10/14/19 14:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**728**	mg/L	20.0	8.7	1		10/21/19 18:14		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.8**	Std. Units	0.10	0.010	1		10/28/19 11:12		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**32.3**	mg/L	2.0	0.50	1		10/26/19 14:59	16887-00-6	
Fluoride	**0.62**	mg/L	0.30	0.10	1		10/26/19 14:59	16984-48-8	
Sulfate	**339**	mg/L	30.0	10.0	10		10/28/19 14:39	14808-79-8	

Sample: B-11R **Lab ID: 40197444004** Collected: 10/14/19 14:45 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**1440**	ug/L	10.0	3.0	1	10/22/19 06:36	10/24/19 13:55	7440-42-8	
Calcium	**66000**	ug/L	254	76.2	1	10/22/19 06:36	10/24/19 13:55	7440-70-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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(920)469-2436

ANALYTICAL RESULTS

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

Sample: B-11R **Lab ID: 40197444004** Collected: 10/14/19 14:45 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Field pH	**6.83**	Std. Units			1		10/14/19 14:45		
Field Specific Conductance	**612**	umhos/cm			1		10/14/19 14:45		
Oxygen, Dissolved	**0.10**	mg/L			1		10/14/19 14:45	7782-44-7	
REDOX	**-4.7**	mV			1		10/14/19 14:45		
Turbidity	**7.50**	NTU			1		10/14/19 14:45		
Static Water Level	**613.06**	feet			1		10/14/19 14:45		
Temperature, Water (C)	**14.5**	deg C			1		10/14/19 14:45		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**310**	mg/L	20.0	8.7	1		10/21/19 18:14		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.0**	Std. Units	0.10	0.010	1		10/28/19 11:14		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**13.1**	mg/L	2.0	0.50	1		10/26/19 15:13	16887-00-6	
Fluoride	**0.26J**	mg/L	0.30	0.10	1		10/26/19 15:13	16984-48-8	
Sulfate	**40.7**	mg/L	3.0	1.0	1		10/26/19 15:13	14808-79-8	

Sample: B-31R **Lab ID: 40197444005** Collected: 10/14/19 17:55 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**915**	ug/L	10.0	3.0	1	10/22/19 06:36	10/24/19 14:02	7440-42-8	
Calcium	**110000**	ug/L	254	76.2	1	10/22/19 06:36	10/24/19 14:02	7440-70-2	
Field Data	Analytical Method:								
Field pH	**6.72**	Std. Units			1		10/14/19 17:55		
Field Specific Conductance	**837**	umhos/cm			1		10/14/19 17:55		
Oxygen, Dissolved	**0.10**	mg/L			1		10/14/19 17:55	7782-44-7	
REDOX	**20.7**	mV			1		10/14/19 17:55		
Turbidity	**2.81**	NTU			1		10/14/19 17:55		
Static Water Level	**612.5**	feet			1		10/14/19 17:55		
Temperature, Water (C)	**14.2**	deg C			1		10/14/19 17:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**480**	mg/L	20.0	8.7	1		10/21/19 18:14		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.0**	Std. Units	0.10	0.010	1		10/28/19 11:15		H6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

Sample: B-31R **Lab ID: 40197444005** Collected: 10/14/19 17:55 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**26.0**	mg/L	2.0	0.50	1		10/26/19 15:27	16887-00-6	
Fluoride	**0.25J**	mg/L	0.30	0.10	1		10/26/19 15:27	16984-48-8	
Sulfate	**146**	mg/L	30.0	10.0	10		10/28/19 14:53	14808-79-8	

Sample: B-31A **Lab ID: 40197444006** Collected: 10/14/19 18:30 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**98.5**	ug/L	10.0	3.0	1	10/22/19 06:36	10/24/19 14:22	7440-42-8	
Calcium	**52200**	ug/L	254	76.2	1	10/22/19 06:36	10/24/19 14:22	7440-70-2	
Field Data	Analytical Method:								
Field pH	**7.69**	Std. Units			1		10/14/19 18:30		
Field Specific Conductance	**514**	umhos/cm			1		10/14/19 18:30		
Oxygen, Dissolved	**0.12**	mg/L			1		10/14/19 18:30	7782-44-7	
REDOX	**-60.5**	mV			1		10/14/19 18:30		
Turbidity	**2.66**	NTU			1		10/14/19 18:30		
Static Water Level	**613.2**	feet			1		10/14/19 18:30		
Temperature, Water (C)	**14.2**	deg C			1		10/14/19 18:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**272**	mg/L	20.0	8.7	1		10/21/19 18:14		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.7**	Std. Units	0.10	0.010	1		10/28/19 11:18		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**47.1**	mg/L	2.0	0.50	1		10/26/19 15:41	16887-00-6	
Fluoride	**0.22J**	mg/L	0.30	0.10	1		10/26/19 15:41	16984-48-8	
Sulfate	**22.3**	mg/L	3.0	1.0	1		10/26/19 15:41	14808-79-8	

Sample: B-39 **Lab ID: 40197444007** Collected: 10/15/19 08:55 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**203**	ug/L	10.0	3.0	1	10/22/19 06:36	10/24/19 14:29	7440-42-8	
Calcium	**60900**	ug/L	254	76.2	1	10/22/19 06:36	10/24/19 14:29	7440-70-2	
Field Data	Analytical Method:								
Field pH	**6.41**	Std. Units			1		10/15/19 08:55		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

Sample: B-39 **Lab ID: 40197444007** Collected: 10/15/19 08:55 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Field Specific Conductance	**428**	umhos/cm			1		10/15/19 08:55		
Oxygen, Dissolved	**0.16**	mg/L			1		10/15/19 08:55	7782-44-7	
REDOX	**202**	mV			1		10/15/19 08:55		
Turbidity	**0.49**	NTU			1		10/15/19 08:55		
Static Water Level	**613.35**	feet			1		10/15/19 08:55		
Temperature, Water (C)	**15**	deg C			1		10/15/19 08:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**206**	mg/L	20.0	8.7	1		10/21/19 18:14		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**6.7**	Std. Units	0.10	0.010	1		10/28/19 11:20		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**0.78J**	mg/L	2.0	0.50	1		10/26/19 15:55	16887-00-6	
Fluoride	**0.26J**	mg/L	0.30	0.10	1		10/26/19 15:55	16984-48-8	
Sulfate	**2.0J**	mg/L	3.0	1.0	1		10/26/19 15:55	14808-79-8	

Sample: B-26 **Lab ID: 40197444008** Collected: 10/15/19 10:15 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**<3.0**	ug/L	10.0	3.0	1	10/22/19 06:36	10/24/19 14:36	7440-42-8	
Calcium	**<76.2**	ug/L	254	76.2	1	10/22/19 06:36	10/24/19 14:36	7440-70-2	
Field Data	Analytical Method:								
Field pH	**7.24**	Std. Units			1		10/15/19 10:15		
Field Specific Conductance	**753**	umhos/cm			1		10/15/19 10:15		
Oxygen, Dissolved	**12.17**	mg/L			1		10/15/19 10:15	7782-44-7	
REDOX	**175.8**	mV			1		10/15/19 10:15		
Turbidity	**1.5**	NTU			1		10/15/19 10:15		
Static Water Level	**613.10**	feet			1		10/15/19 10:15		
Temperature, Water (C)	**11.6**	deg C			1		10/15/19 10:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**404**	mg/L	20.0	8.7	1		10/21/19 18:15		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**7.4**	Std. Units	0.10	0.010	1		10/29/19 11:03		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**30.5**	mg/L	2.0	0.50	1		10/26/19 16:09	16887-00-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

Sample: B-26 **Lab ID: 40197444008** Collected: 10/15/19 10:15 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions	Analytical Method: EPA 300.0								
Fluoride	**<0.10**	mg/L	0.30	0.10	1		10/26/19 16:09	16984-48-8	
Sulfate	**36.0**	mg/L	3.0	1.0	1		10/26/19 16:09	14808-79-8	

Sample: FIELD BLANK **Lab ID: 40197444009** Collected: 10/15/19 08:55 Received: 10/17/19 08:25 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Boron	**41.2**	ug/L	10.0	3.0	1	10/22/19 06:36	10/24/19 11:59	7440-42-8	
Calcium	**72000**	ug/L	254	76.2	1	10/22/19 06:36	10/24/19 11:59	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<8.7**	mg/L	20.0	8.7	1		10/21/19 18:15		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	**6.3**	Std. Units	0.10	0.010	1		10/29/19 11:10		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
Chloride	**<0.50**	mg/L	2.0	0.50	1		10/26/19 16:23	16887-00-6	
Fluoride	**<0.10**	mg/L	0.30	0.10	1		10/26/19 16:23	16984-48-8	
Sulfate	**<1.0**	mg/L	3.0	1.0	1		10/26/19 16:23	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

QC Batch: 338250 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 40197444001, 40197444002, 40197444003, 40197444004, 40197444005, 40197444006, 40197444007, 40197444008, 40197444009

METHOD BLANK: 1964527 Matrix: Water
Associated Lab Samples: 40197444001, 40197444002, 40197444003, 40197444004, 40197444005, 40197444006, 40197444007, 40197444008, 40197444009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	10/24/19 11:53	
Calcium	ug/L	<76.2	254	10/24/19 11:53	

LABORATORY CONTROL SAMPLE: 1964532

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	500	461	92	80-120	
Calcium	ug/L	5000	4970	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1964533 1964534

Parameter	Units	40197270003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	5.8J	500	500	471	483	93	95	75-125	3	20	
Calcium	ug/L	9090	5000	5000	14200	14700	101	112	75-125	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

QC Batch: 338232 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 40197444001, 40197444002, 40197444003, 40197444004, 40197444005, 40197444006, 40197444007, 40197444008, 40197444009

METHOD BLANK: 1964447 Matrix: Water
Associated Lab Samples: 40197444001, 40197444002, 40197444003, 40197444004, 40197444005, 40197444006, 40197444007, 40197444008, 40197444009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/21/19 18:11	

LABORATORY CONTROL SAMPLE: 1964448

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	600	526	88	80-120	

SAMPLE DUPLICATE: 1964449

Parameter	Units	40197371001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	578	580	0	10	

SAMPLE DUPLICATE: 1964450

Parameter	Units	40197444001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	208	224	7	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

QC Batch: 338857 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 40197444001, 40197444002, 40197444003, 40197444004, 40197444005, 40197444006, 40197444007

SAMPLE DUPLICATE: 1968480

Parameter	Units	40197444001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.9	6.9	1	20	H6

SAMPLE DUPLICATE: 1968481

Parameter	Units	40197624003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.8	1	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

QC Batch: 338999 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 40197444008, 40197444009

SAMPLE DUPLICATE: 1968936

Parameter	Units	40197444008 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.4	0	20	H6

SAMPLE DUPLICATE: 1968937

Parameter	Units	40197979009 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.4	8.4	0	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

QC Batch: 338645 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 40197444001, 40197444002, 40197444003, 40197444004, 40197444005, 40197444006, 40197444007, 40197444008, 40197444009

METHOD BLANK: 1966863 Matrix: Water
Associated Lab Samples: 40197444001, 40197444002, 40197444003, 40197444004, 40197444005, 40197444006, 40197444007, 40197444008, 40197444009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	2.0	10/26/19 11:32	
Fluoride	mg/L	<0.10	0.30	10/26/19 11:32	
Sulfate	mg/L	<1.0	3.0	10/26/19 11:32	

LABORATORY CONTROL SAMPLE: 1966864

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.5	97	90-110	
Fluoride	mg/L	2	2.0	99	90-110	
Sulfate	mg/L	20	19.7	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1966865 1966866

Parameter	Units	40197409001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	184	1000	1000	1140	1170	96	99	90-110	3	15	
Fluoride	mg/L	12.9J	100	100	125	127	112	115	90-110	2	15	M0
Sulfate	mg/L	73.8J	1000	1000	1040	1080	97	101	90-110	4	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1966867 1966868

Parameter	Units	40197427001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	14900	20000	20000	36000	36300	106	107	90-110	1	15	
Fluoride	mg/L	686	2000	2000	3060	3080	119	120	90-110	1	15	M0
Sulfate	mg/L	ND	20000	20000	21400	21600	103	104	90-110	1	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219071.00 NELSON DEWEY CCR
Pace Project No.: 40197444

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40197444001	**B-7R**	EPA 3010	338250	EPA 6020	338340
40197444002	**B-11A**	EPA 3010	338250	EPA 6020	338340
40197444003	**B-11B**	EPA 3010	338250	EPA 6020	338340
40197444004	**B-11R**	EPA 3010	338250	EPA 6020	338340
40197444005	**B-31R**	EPA 3010	338250	EPA 6020	338340
40197444006	**B-31A**	EPA 3010	338250	EPA 6020	338340
40197444007	**B-39**	EPA 3010	338250	EPA 6020	338340
40197444008	**B-26**	EPA 3010	338250	EPA 6020	338340
40197444009	**FIELD BLANK**	EPA 3010	338250	EPA 6020	338340
40197444001	**B-7R**				
40197444002	**B-11A**				
40197444003	**B-11B**				
40197444004	**B-11R**				
40197444005	**B-31R**				
40197444006	**B-31A**				
40197444007	**B-39**				
40197444008	**B-26**				
40197444001	**B-7R**	SM 2540C	338232		
40197444002	**B-11A**	SM 2540C	338232		
40197444003	**B-11B**	SM 2540C	338232		
40197444004	**B-11R**	SM 2540C	338232		
40197444005	**B-31R**	SM 2540C	338232		
40197444006	**B-31A**	SM 2540C	338232		
40197444007	**B-39**	SM 2540C	338232		
40197444008	**B-26**	SM 2540C	338232		
40197444009	**FIELD BLANK**	SM 2540C	338232		
40197444001	**B-7R**	EPA 9040	338857		
40197444002	**B-11A**	EPA 9040	338857		
40197444003	**B-11B**	EPA 9040	338857		
40197444004	**B-11R**	EPA 9040	338857		
40197444005	**B-31R**	EPA 9040	338857		
40197444006	**B-31A**	EPA 9040	338857		
40197444007	**B-39**	EPA 9040	338857		
40197444008	**B-26**	EPA 9040	338999		
40197444009	**FIELD BLANK**	EPA 9040	338999		
40197444001	**B-7R**	EPA 300.0	338645		
40197444002	**B-11A**	EPA 300.0	338645		
40197444003	**B-11B**	EPA 300.0	338645		
40197444004	**B-11R**	EPA 300.0	338645		
40197444005	**B-31R**	EPA 300.0	338645		
40197444006	**B-31A**	EPA 300.0	338645		
40197444007	**B-39**	EPA 300.0	338645		
40197444008	**B-26**	EPA 300.0	338645		
40197444009	**FIELD BLANK**	EPA 300.0	338645		

REPORT OF LABORATORY ANALYSIS

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CHAIN OF CUSTODY

UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

40197444
~~40197442~~ HMB 10/17

(Please Print Clearly)

Company Name:	SCS Engineers
Branch/Location:	Madison WI
Project Contact:	Tom Karwoski, Meghan Blodgett
Phone:	608-224-2830
Project Number:	25219071.00
Project Name:	Nelson Dewey
Project State:	Wisconsin
Sampled By (Print):	Adam Watson
Sampled By (Sign):	[signature]
PO #:	
Regulatory Program:	

~~Quote~~ #:	Meghan Blodgett
Mail To Contact:	Tom Karwoski
Mail To Company:	SCS Engineers
Mail To Address:	mblodgett@scsengineers.com
Invoice To Contact:	
Invoice To Company:	
Invoice To Address:	
Invoice To Phone:	

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☐ NOT needed on your sample

Matrix Codes
A = Air, B = Biota, C = Charcoal, O = Oil, S = Soil, Sl = Sludge
W = Water, DW = Drinking Water, GW = Ground Water, SW = Surface Water, WW = Waste Water, WP = Wipe

					Boron, Calcium	TDS, Cl, F, SO4	PH
				FILTERED? (YES/NO) Y/N	N	N	N
				PRESERVATION (CODE)* Pick Letter	D	A	A
PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	Analyses Requested		
001	B-7R	10/14	1320		X	X	X
002	B-11A	↓	1430		X	X	X
003	B-11B	↓	1455		X	X	X
004	B-1AR	↓	1445		X	X	X
005	B-31R	↓	1755		X	X	X
006	B-31A	↓	1830		X	X	X
007	B-39	10/15	855		X	X	X
008	B-26	↓	1015		X	X	X
009	Field blank	↓	855		X	X	X

CLIENT COMMENTS | LAB COMMENTS (Lab Use Only) | Profile #

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):

Email #1:	
Email #2:	
Telephone:	
Fax:	

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
		CS Logistics	
CS Logistics	10/17/19 0825	[signature] PACE	10/17/19 0825

PACE Project No. 40197444 ~~40197442~~ HMB 10/17

Receipt Temp = ROI °C

Sample Receipt pH
OK / Adjusted

Cooler Custody Seal
Present / **Not Present**
Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Sample Preservation Receipt Form

Client Name: SCS Engineers

Project # 401974442 HMP 10/17
401974444

All containers needing preservation have been checked and noted below: ☑Yes ☐No ☐N/A

Initial when completed: JD

Date/ Time:

Lab Lot# of pH paper: 10 US 0891

Lab Std #ID of preservation (if pH adjusted):

	Glass							Plastic							Vials						Jars			General							
Pace Lab #	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3B	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T	ZPLC	GN	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001											2		1																	X		2.5 / 5 / 10
002											2		1																	X		2.5 / 5 / 10
003											2		1																	X		2.5 / 5 / 10
004											2		1																	X		2.5 / 5 / 10
005											2		1																	X		2.5 / 5 / 10
006											2		1																	X		2.5 / 5 / 10
007											2		1																	X		2.5 / 5 / 10
008											2		1																	X		2.5 / 5 / 10
009											2		1																	X		2.5 / 5 / 10
010																																2.5 / 5 / 10
011																																2.5 / 5 / 10
012																																2.5 / 5 / 10
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016																																2.5 / 5 / 10
017																																2.5 / 5 / 10
018																																2.5 / 5 / 10
019																																2.5 / 5 / 10
020																																2.5 / 5 / 10

10/17/19 10/17/19 10/17/19

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : ☐Yes ☐No ☑N/A ***If yes look in headspace column**

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3B	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	

Pace Analytical™ 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 25Apr2018
	Document No.: F-GB-C-031-Rev.07	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO#: 40197444

40197444

Client Name: SCS Engineers

Courier: ☒ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco ☐ Client ☐ Pace Other:

Tracking #: 2042-101619

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☒ Other ziplock / plastic bags

Thermometer Used SR - NA **Type of Ice:** (Wet) Blue Dry None ☒ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: ROT /Corr: —

Temp Blank Present: ☐ yes ☒ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Person examining contents:
Date: 10/17/19
Initials: JD

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☒No ☐N/A	2. NO PO # INVOICE TO NOT documented 10/17/19
Chain of Custody Relinquished:	☐Yes ☒No ☐N/A	3. CUSTOMER NOT Relinquished 10/17/19 JD
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☒Yes ☐No	6.
Rush Turn Around Time Requested:	☐Yes ☒No	7.
Sufficient Volume: For Analysis: ☒Yes ☐No MS/MSD: ☐Yes ☒No ☐N/A		8.
Correct Containers Used:	☒Yes ☐No	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☒N/A	
Containers Intact:	☒Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: W		
Trip Blank Present:	☐Yes ☐No ☒N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: AGR DM **Date:** 10/17/19

Page 2 of 2

Appendix B

Alternative Source Demonstrations

B1 Alternative Source Demonstration, October 2018 Detection Monitoring

Alternative Source Demonstration
October 2018 Detection Monitoring

Nelson Dewey Generating Station
Slag Pond
Cassville, Wisconsin

Prepared for:

SCS ENGINEERS

25216071.18 | April 15, 2019

2830 Dairy Drive
Madison, WI 53718-6751
608-224-2830

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Figures

Appendices

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PE CERTIFICATION

I, Sherren Clark, hereby certify that that the information in this alternate source demonstration is accurate and meets the requirements of 40 CFR 257.94(e)(2). This certification is based on my review of the groundwater data and related site information available for the Nelson Dewey Generating Station Slag Pond facility. I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.

SL Clark 4-12-19

(signature) (date)

Sherren Clark

(printed or typed name)

License number E-29863

My license renewal date is July 31, 2020.

Pages or sheets covered by this seal:

Alternative Source Demonstration, all pages

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1.0 INTRODUCTION

This Alternative Source Demonstration (ASD) was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" published by the U.S. Environmental Protection Agency (USEPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (USEPA, 2015), and subsequent amendments. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.94(e)(2). The applicable sections of the Rule are provided below in *italics*.

1.1 §257.94(E)(2) ALTERNATIVE SOURCE DEMONSTRATION REQUIREMENTS

The owner and operator may demonstrate that a source other than the CCR Unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels.

An ASD is completed when there are exceedances of one or more benchmarks established within the groundwater monitoring program. The ASD is completed to determine if any other sources are likely causes of the identified exceedance(s) of established benchmark(s) at the site. This ASD was performed in response to results indicating a statistically significant increase (SSI) over background levels during detection monitoring under the CCR Rule.

This ASD report is evaluating the SSIs observed in the statistical evaluation of the October 2018 detection monitoring event at the Nelson Dewey Generating Station (NED). Previously, two ASDs were prepared for this facility evaluating the SSIs observed in the statistical evaluation of the October 2017 and for the April 2018 detection monitoring event (SCS Engineers [SCS], 2018b and 2018c). The October 2017 ASD (dated April 2018) and the April 2018 ASD (dated October 2018) concluded that several lines of evidence demonstrated that SSIs reported for boron, calcium, fluoride, field pH, sulfate, and total dissolved solids (TDS) concentrations in the downgradient monitoring wells were likely due to man-made sources and/or naturally occurring constituents in the alluvial aquifer.

As discussed in more detail in **Section 4.2** of this ASD, the findings for the October 2018 monitoring event were generally consistent with those for the previous event.

1.2 SITE INFORMATION AND MAP

The NED site is located along the east bank of the Mississippi River, north of the Village of Cassville, in Grant County, Wisconsin (**Figure 1**). The facility includes a decommissioned coal fired generating plant, a CCR landfill that was closed in 2001, a closed slag pond, and a closed wastewater treatment pond. The layout of the site on an aerial photograph base is shown on **Figure 2.** The closed landfill at the NED facility was permitted under Wisconsin Department of Natural Resources (WDNR) License #02525.

The existing CCR unit evaluated for this ASD is:

- Slag Pond (former existing CCR surface impoundment)

A map showing the CCR unit and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR groundwater monitoring program and the state monitoring program is provided as **Figure 3**.

Operations at the facility began in the late 1950s, and a CCR impoundment that included what is now the Slag Pond closure area was commissioned at that time. The CCR landfill was initially licensed in 1976 and received fly ash from NED until it was closed in phases between 1996 and 2001. The CCR landfill was initially operated as a fly ash sluice basin, then transitioned to dry ash placement prior to closure. The wastewater ponds, now closed, were constructed in 1976 for the purpose of settling CCR from the NED process wastewater streams and sediment from storm water runoff prior to discharge. Both NED generating units were retired on December 31, 2015, and have since been decommissioned. The generating station was demolished in 2017.

1.3 STATISTICALLY SIGNIFICANT INCREASES IDENTIFIED

SSIs were identified for boron, fluoride, sulfate, and TDS at one or more wells in the October 2018 monitoring event. Sulfate and TDS SSIs were confirmed from the November 2018 sampling event. A summary of the October 2018 constituent concentrations and the established benchmark concentrations are provided in **Table 1**. The October 2017, April 2018, and November 2018 resampling results are also included for comparison. The constituent concentrations with SSIs above the background concentrations are highlighted in the table.

The SSIs for the October 2018 event were generally consistent with the October 2017 and April 2018 SSIs, with a few changes. New SSIs were identified for sulfate at B-31R and for TDS at B-11B and B-31R. There were no SSIs for field pH.

1.4 OVERVIEW OF ASD APPROACH

This ASD report includes:

- Background information (**Section 2.0**)
- Evaluation of potential that SSIs are due to methodology or analysis (**Section 3.0**)
- Evaluation of potential that SSIs are due to natural sources or man-made sources other than the CCR Units (**Section 4.0**)
- ASD conclusions (**Section 5.0**)
- Monitoring recommendations (**Section 6.0**)

The CCR Rule constituent results from background and compliance sampling for the parameter with SSIs are provided in **Table 2**. Complete laboratory reports for the background monitoring events and the October 2017 detection monitoring event were included in the 2017 Annual Groundwater Monitoring and Corrective Action Report for the NED Slag Pond (SCS, 2018a). The laboratory reports for the April 2018 and October 2018 events were included in the 2018 Annual Groundwater Monitoring and Corrective Action Report.

2.0 BACKGROUND

To provide context for the ASD evaluation, the following background information is provided in this section of the report, prior to the ASD evaluation sections:

- Geologic and hydrogeologic setting
- CCR Rule monitoring system
- Other monitoring wells

A more detailed discussion of the background information for the site is provided in the ASD for the October 2017 event (SCS, 2018b).

2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

2.1.1 Regional Information

The uppermost geologic formation beneath the NED plant is the surficial alluvial aquifer. The alluvial aquifer consists of Mississippi River valley sand and gravel deposits, and is the uppermost aquifer as defined in section 257.53 of the CCR Rule. This deposit is prevalent along the edges of the entire Mississippi River valley in southwestern Wisconsin.

The alluvial aquifer is underlain by dolomitic bedrock of the Prairie du Chien Group. The dolomite bedrock is also an aquifer and is likely hydraulically connected to the alluvial aquifer above.

Regionally, groundwater flow is generally to the southwest and discharges to the Mississippi River.

Additional details on the regional geology were provided in the October 2017 ASD (SCS, 2018b).

2.1.2 Site Information

The thickness of the alluvium in the immediate vicinity of the plant is over 125 feet, as evidenced by local water supply well logs (SCS, 2018b). These logs are also evidence that the alluvial aquifer yields useable quantities of groundwater for supply wells in the area. Soil boring logs for monitoring wells installed at the site also generally indicate sand and gravel soils within the monitored depths.

The groundwater flow direction in the vicinity of the plant is generally southwest toward the Mississippi River. Historically, infiltration at the former slag pond, former fly ash basin, and the former Wisconsin Pollutant Discharge Elimination System (WPDES) ponds caused groundwater mounding to be present around these features; however, these ponds have now all been closed and are no longer sources of infiltration.

Site water level measurements generally indicate that groundwater flow is to the southwest, discharging to the Mississippi River. However, during periods of high river water levels, the flow temporarily reverses and the river discharges to the shallow sand and gravel aquifer. The groundwater flow direction during the October 2018 detection monitoring event was toward the Mississippi River with flow moving south to southwest (**Figure 4**). The groundwater elevations are provided in **Table 3**.

2.2 CCR RULE MONITORING SYSTEM

The groundwater monitoring system established in accordance with the CCR Rule consists of one upgradient (background) monitoring well and six downgradient monitoring wells. The background well is B-26. The downgradient wells include B-7R, B-11A, B-11B, B-11R, B-31A, and B-31R. The CCR Rule wells are installed within the surficial alluvium aquifer. Well depths range from approximately 23 to 114 feet, measured from the top of the well casing.

2.3 OTHER MONITORING WELLS

There are 19 groundwater monitoring wells at the NED facility that are part of the monitoring system developed for the state monitoring program. All of the wells included in the CCR monitoring well network were already in use for the state monitoring program. The well locations are shown on

Figure 3. These 19 monitoring wells and two private wells are used to monitor groundwater conditions at the site under WDNR License Number 2525, which includes the closed CCR landfill (former fly ash settling basin) and the closed Slag Pond. Monitoring wells for the state monitoring program are installed in the surficial sand and gravel aquifer which is the uppermost aquifer as defined under 40 CFR 257.53.

3.0 METHODOLOGY AND ANALYSIS REVIEW

To evaluate the potential that an SSI is due to a source other than the regulated CCR unit, SCS Engineers (SCS) used a two-step evaluation process. First, the sample collection, field and laboratory analysis, and statistical evaluation were reviewed to identify any potential error or analysis that led to an exceedance of the benchmark. Second, potential alternative sources, including natural variation and man-made sources other than the CCR unit, were evaluated. This section of the report provides the findings of the methodology and analysis review. Section 4.0 of the report addresses the potential alternative sources.

3.1 SAMPLING AND FIELD ANALYSIS REVIEW

Field notes and sampling results were reviewed to determine if any sampling error may have caused or contributed to the observed SSIs. Potential field sampling errors or issues could include mislabeling of samples, improper sample handling, missed holding times, cross contamination during sampling, or other field error. Field blank sample results were also reviewed for any indication of potential contamination from sampling equipment or containers. Based on the review of the field notes and results, SCS did not identify any indication that the SSIs were due to a sampling error.

SCS did not identify any issues with the field pH analysis based on review of the data and field notes. Because boron, fluoride, TDS, and sulfate are laboratory parameters, there is little potential for a field analysis error to contribute to an SSI.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory reports for the October 2018 and November 2018 resample detection monitoring events were reviewed to determine if any laboratory analysis error or issue may have caused or contributed to the observed SSIs. The laboratory report review included reviewing the laboratory quality control flags and narrative, verifying that correct methods were used and desired detection limits were achieved, and checking the field and laboratory blank sample results. Laboratory reports for the background monitoring and the October 2017 detection monitoring event were included in the 2017 Annual Groundwater Monitoring and Corrective Action Report for the facility and were reviewed as part of the ASD preparation for the October 2017 detection monitoring event.

Based on the review of the laboratory reports, SCS did not identify any indication that any SSI was due to a laboratory analysis error. There were no laboratory quality control flags or issues identified in the laboratory reports that affect the usability of the data for detection monitoring. TDS was detected in the field blank during the November 2018 resampling event, but this detection was determined not to affect the usability of the data because the reported TDS concentration was below the limit of quantitation and was an order of magnitude less than the concentrations detected in the monitoring wells.

Time series plots of the SSI constituent analytical data were also reviewed for any anomalous results that might indicate a possible sampling or laboratory error (e.g., dilution error or incorrect sample labeling). The time series plots are provided in Appendix A. The October and November 2018 results for the downgradient wells are generally consistent with the historical data. The increasing boron

concentrations at B-11B are consistent with an increase in boron concentrations observed at this well since 2010 under the state monitoring program. Boron concentrations at B-11B remain below those observed prior to the CCR landfill closure. The sulfate concentrations detected at B-31R in October and November 2018 are the highest detected at this well in several years, but remain below the highest concentrations observed prior to the CCR landfill closure.

3.3 STATISTICAL EVALUATION REVIEW

The review of the statistical results and methods included a quality control check of the following:

- Input analytical data vs. laboratory analytical reports
- Review of statistical method and outlier concentration lists for each monitoring well/CCR unit

Based on the review of the statistical evaluation, SCS did not identify any errors or issues in the statistical evaluation that caused or contributed to the determination of interwell SSIs for boron, fluoride, pH, sulfate, and TDS at the downgradient monitoring wells.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

In summary, there were no changes to the SSI determinations for the October 2018 and the November 2018 resampling detection monitoring events based on the methodology and analysis review, and no errors or issues causing or contributing to the reported SSIs were identified.

4.0 ALTERNATIVE SOURCES

This section of the report discusses the potential alternative sources for the SSI constituents at the downgradient wells, identifies the most likely alternative source(s), and presents the lines of evidence indicating that an alternative source is the most likely cause of the observed SSIs.

4.1 POTENTIAL CAUSES OF SSI

4.1.1 Natural Variation

The statistical analysis was completed using an interwell approach, comparing the October 2018 and the November 2018 resampling detection monitoring results to the upper prediction limits (UPLs) calculated based on sampling of the background well (B-26). If concentrations of a constituent that is naturally present in the aquifer vary spatially, then the potential exists that the downgradient concentrations may be higher than upgradient concentrations due to natural variation.

Although natural variation is present in the shallow aquifer, it does not appear likely that natural variation is the primary source causing the boron, and sulfate SSIs. These parameters were detected at higher concentrations than would likely be present naturally.

Based on fluoride data for wells in the Grant County, natural variation may also have caused or contributed to the SSI for fluoride at B-11B.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the boron, fluoride, pH, sulfate, and TDS SSIs could include the closed CCR landfill, the coal storage area, or other plant operations.

Based the groundwater flow directions and on previous investigations at the site, the closed landfill appears to be the most likely cause of the SSIs for the downgradient wells B-7R, B-11A, B-11B, B-11R, B-31A, and B-31R.

4.2 LINES OF EVIDENCE

Lines of evidence indicating that natural variation may also have caused or contributed to the fluoride SSIs include:

1. Although fluoride was not detected in background well B-26, publicly available data from the WDNR's Groundwater Retrieval Network (GRN) database indicates it is commonly detected in Grant County.

The lines of evidence indicating that the SSIs for boron, fluoride, pH, sulfate, and TDS in one or more compliance wells relative to the background well are more likely due to the closed landfill and prior fly ash sluicing than to the slag pond including:

1. A previous Environmental Contamination Assessment completed for the ash disposal facility indicated that the fly ash sluicing and landfill were the primary source of the groundwater impacts in the area, based on multiple lines of evidence.

2. Sampling performed in preparation for the slag pond closure indicated that the slag and the slag pond sediment had little potential to cause the SSIs for boron, fluoride, and sulfate.

3. Past and current groundwater monitoring performed under the state monitoring program shows that groundwater quality has improved since the 1990s in response to termination of fly ash sluicing and closure, and capping of the ash landfill.

Each of these lines of evidence and the supporting data were discussed in detail in the ASD for the October 2017 detection monitoring event (SCS, 2018b), with the exception of the TDS SSI concentrations. The lines of evidence are discussed briefly below, focusing on any updated information collected since the previous ASD, with references to the previous ASD for additional details.

4.2.1 Grant County Fluoride Data

Natural variation may have caused or contributed to the SSI for fluoride at B-11B. Although fluoride was not detected in background well B-26, publicly available data from the WDNR's GRN database indicates it is commonly detected in Grant County. Out of a total of 423 fluoride analysis results in the GRN database for water supply wells in Grant County, 88 percent had fluoride detected. The average concentration of fluoride in Grant County well samples with fluoride detections was 0.39 milligrams per liter (mg/L). The fluoride concentration reported for B-11B for October 2018, 0.61 mg/L, is in the range of concentrations in the GRN database for Grant County. As discussed below, there is also a potential that fluoride concentrations in B-11B are associated with impacts from the closed CCR landfill.

4.2.2 Previous CCR Pond and Landfill Study

A previous investigation titled *Environmental Contamination Assessment: Nelson Dewey Generating Station Ash Disposal Facility*, completed by RMT in 1994, found that groundwater impacts were associated with disposal of fly ash in the now-closed CCR landfill located immediately north of the slag pond (**Figure 3**). The purpose of the 1994 Environmental Contamination Assessment (ECA) was

to investigate the impacts to groundwater at the NED landfill. The ECA was used to evaluate feasibility of possible remedial alternatives. The remedial alternative that was ultimately selected was to convert the plant to dry fly ash handling.

The primary lines of evidence from the 1994 report that support the current ASD for boron, fluoride, pH, sulfate, and TDS include:

- Water leaching tests for ash and slag indicated that boron and sulfate concentrations in the slag leachate were orders of magnitude lower than in the ash leachate (**Appendix B**, **Table 5**).

- Surface water samples from the active ash sluice pond and the slag pond indicated that boron and sulfate concentrations in the slag pond were one or more orders of magnitude lower than in the ash sluice pond. Surface water boron and sulfate concentrations in the slag pond were higher than leach test results, which was attributed to infiltration of ash sluice pond water through the berm between the ponds into the slag pond (**Appendix B**, **Table 6**).

- Groundwater sampling at monitoring wells B-38 and B-38A (now abandoned), which were installed through and screened below the ash disposal area (now closed landfill), indicated that groundwater affected by ash sluicing was characterized by high pH and elevated concentrations of boron, fluoride, sulfate, and TDS (**Appendix B**, **Table 8**).

The results of the 1994 ECA were reported to WDNR on November 1994. The ECA investigation was then used for a feasibility study to determine appropriate ash disposal operation on site. Following the ECA, the plant converted to a dry ash handling system. Dry ash was placed in the CCR landfill through the 1990s, and the landfill was capped and closed in phases in 1996 through 2001. After that time, fly ash was not disposed of at the facility.

4.2.3 Slag Pond Closure Sampling Results

Results of leaching test analysis performed for slag, ash, soil, and sediment were submitted as part of a Low Hazard Exemption Request to the WDNR in March 2017 (SCS, 2017). The Exemption Request was submitted as part of the Closure Plan for the site and requested WDNR approval to consolidate materials from decommissioning activities in the Slag Pond and Slag Handling Area, which would then be capped with a composite final cover system. The sediment and soil samples were collected to characterize the materials that would remain on site under the Closure Plan. Leaching tests were performed using ASTM water leach test methods. The leaching test analytical results for parameters with SSIs that were included in the leaching test program (boron, fluoride, and sulfate) are summarized in **Appendix C**.

The sampling results in the Exemption Request indicated that the materials to be consolidated and capped were not likely to cause groundwater standard exceedances for boron, fluoride, or sulfate. The leach test results for slag, slag pond sediment, and soil in the slag handling area were below the state groundwater standards for these three parameters. The results were also below the concentrations of boron, fluoride, and sulfate in the downgradient CCR wells with SSIs, and well below the historic results for former well B-38, which was located within the CCR landfill area, upgradient from the slag pond.

The Low Hazard Exemption was granted by the WDNR based on the sampling results and other information presented.

4.2.4 State Program Groundwater Monitoring Results

Past and current groundwater monitoring performed under the state monitoring program shows that groundwater quality has improved substantially since the 1990s in response to termination of fly ash sluicing, and closure and capping of the ash landfill (SCS, 2018b). The long-term trends show that concentrations of boron and sulfate in groundwater have decreased since termination of fly ash sluicing and closure of the landfill, in some cases by an order of magnitude or more. The results suggest that current boron and sulfate concentrations are likely residual contamination from historic ash disposal in the CCR landfill area. Increasing boron concentrations at B-11B and sulfate concentrations at B-31R appear to be attributable to the closed CCR landfill and to changes in groundwater flow at the site, related to a decrease in the volume of water discharged to the slag pond and subsequent closure of the slag pond.

5.0 ASD CONCLUSIONS

The lines of evidence discussed above regarding the SSIs reported for boron, fluoride, field pH, sulfate, and TDS concentrations in downgradient monitoring wells demonstrate that the SSIs are likely primarily due to historic ash disposal in the closed landfill, which is not subject to the requirements of 40 CFR 257.50-107. The landfill is regulated by the WDNR under the solid waste program (License 02525). The SSIs for fluoride and field pH at B-11A, B-11B, B-11R, and B-31A may also be at least partially due to natural variability.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

In accordance with section 257.94(e)(2) of the CCR Rule, the NED slag pond site may continue with detection monitoring based on this ASD. The ASD report will be included in the 2019 Annual Report due January 31, 2019.

7.0 REFERENCES

RMT, 1994, Environmental Contamination Assessment: Nelson Dewey Generating Station Ash Disposal Facility, November 1994.

SCS Engineers, 2019, 2018 Annual Groundwater Monitoring and Corrective Action Report – Nelson Dewey Generating Station, January 2019.

SCS Engineers, 2018a, 2017 Annual Groundwater Monitoring and Corrective Action Report – Nelson Dewey Generating Station, January 2018.

SCS Engineers, 2018b, 2017 Alternative Source Demonstration, October 2017 Monitoring Event, Nelson Dewey Generating Station, April 2018.

SCS Engineers, 2018c, 2018 Alternative Source Demonstration, April 2018 Monitoring Event, Nelson Dewey Generating Station, October 2018.

SCS Engineers, 2017, Low Hazard Exemption Request, Nelson Dewey Generating Station, Cassville, WI, March 2017.

USEPA, 2009, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530-R-09-007, March 2009.

Tables

Table 1. Groundwater Analytical Results Summary - CCR Program - Detection Monitoring
Nelson Dewey Slag Pond, Cassville, WI / SCS Engineers Project #25216071.18

			Background Well			Compliance Wells																			
Parameter Name	**UPL**		**B-26**			**B-7R**			**B-11A**			**B-11B**				**B-11R**			**B-31A**			**B-31R**			
			10/19/2017	4/2/2018	10/8/2018	10/19/2017	4/2/2018	10/9/2018	10/19/2017	4/2/2018	10/9/2018	10/19/2017	4/2/2018	10/9/2018	11/12/2018	10/19/2017	4/2/2018	10/9/2018	10/19/2017	4/2/2018	10/9/2018	10/19/2017	4/2/2018	10/9/2018	11/12/2018
Appendix III																									
Boron, ug/L	66.5		47.4	48.0	53.4	159	121	73	116	91.0	94.2	1,500	2,020	3,620	NA	3,120	3,180	576	63.9	74.8	71.8	645	540	1,430	NA
Calcium, ug/L	155155		102,000	88,100	78,700	56,200 P6	49,200	38,500	55000	53300	48,600	52,400	59,000	66,300	NA	117,000	124,000	49,900	49,600	49,300	46,600	75,700	72,900	125,000	NA
Chloride, mg/L	65.4		79.3	54.4	33.2	12.0	10.1	1.9 J	49.9	54.7 M0	57.8	36.1	31.3	21.9	NA	38.8	36.8	5.9	40.8	42.7	40.2	29	32.6	19.7	NA
Fluoride, mg/L	LOQ (varies by well)	**UPL only**	<0.10	<0.10	<0.1	<0.50 D3	<0.50 D3	<0.1	0.32	0.24 J,M0	0.29 J	0.59	0.65	0.61	NA	<0.50 D3	<0.50 D3,M0	0.15 J	0.16 J	0.13 J	0.17 J	0.14 J	<0.10	<0.1	NA
Field pH, Std. Units	7.81		7.5	7.64	7.20	6.88	6.57	6.23	7.96	8.04	7.43	7.77	8.42	7.74	8.05	7.22	7.14	6.55	7.92	8.00	7.48	7.19	6.76	6.41	6.59
Sulfate, mg/L	44.8		25.3	19.1	25.1	<5.0 D3	<5.0 D3	3.2	5.1	12.3 M0	6	175	200	197	NA	97.7	88.1	15.1	26.1	27.4	24.8	19.2	22.0	186.0	162.0
Total Dissolved Solids, mg/L	594		542	464	450	242	220	186	322	336	332	510	550	602	594	586	638	266	290	282	278	358	374	668	596

Highlighted cell indicates the compliance well result is an SSI. UPLs are based on a 1-of-2 retesting approach; tehrefore, for the October 2018 semiannual event an SSI is indicated only if both the original result and the November 2018 retest are above the UPL and the LOQ.

Abbreviations:
UPL = Upper Prediction Limit
NA = Not Available
LOQ = Limit of Quantification
ug/L = micrograms per liter
LOD = Limit of Detection
mg/L = milligrams per liter

Notes:
D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
J = Estimated concentration at or above the LOD and below the LOQ.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
P6 = Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

Created by: NDK Date: 5/1/2018
Last revision by: AJR Date: 11/28/2018
Checked by: NDK Date: 12/3/2018

I:\25216071.00\Data and Calculations\Tables\[CCR GW Screening Summary_NED.xlsx]Table

Table 2. Analytical Results - Appendix III Constituents with SSIs

Nelson Dewey Generating Station

Cassville, Wisconsin

Well Group	Well	Collection Date	Boron (µg/L)	Field pH (St. Units)	Fluoride (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
Background	B-26	12/9/2015	29.6	7.35	<0.2 U	37.1	424
		4/12/2016	33.7	7.43	<0.2 U	38	456
		7/19/2016	28.6	7.14	<0.2 U	36.2	504
		10/20/2016	33	7.19	0.13 J	35	466
		1/12/2017	35.2	7.57	<0.1 U	35	446
		4/17/2017	50.1	7.54	<0.1 U	32.4	468
		6/7/2017	45.8	7.22	<0.1 U	31	538
		8/2/2017	54.6	7.21	<0.1 U	28.5	496
		10/19/2017	47.4	7.5	<0.1 U	25.3	542
		4/2/2018	48.0	7.64	<0.1 U	19.1	464
		10/8/2018	53.4	7.2	<0.1	25.1	450
Compliance	B-11A	12/9/2015	124	7.7	0.3 J	3.2 J	338
		4/13/2016	116	7.75	0.38 J	3.8 J	362
		7/19/2016	104	7.42	0.35 J	2.7 J	336
		10/19/2016	112	7.47	0.36	3 J	340
		1/12/2017	106	7.89	0.43	2.3 J	322
		4/17/2017	100	7.38	0.36	<1 U	326
		6/8/2017	102	7.78	0.37	1.4 J	338
		8/1/2017	105	7.67	0.37	2.4 J	326
		10/19/2017	116	7.96	0.32	5.1	322
		4/2/2018	91	8.04	0.24 J	12.3	336
		10/9/2018	94.2	7.43	0.29 J	6	332
	B-11B	12/9/2015	1140	8.06	0.44	134	494
		4/13/2016	1360	8.14	0.49	148	512
		7/19/2016	1210	7.77	0.45	165	520
		10/20/2016	1460	7.91	0.53	178	496
		1/12/2017	1540	8.18	0.52	182	488
		4/17/2017	1760	7.83	0.58	181	502
		6/8/2017	1880	8.07	0.59	191	516
		8/1/2017	1800	7.77	0.6	179	498
		10/19/2017	1500	7.77	0.59	175	510
		4/2/2018	2020	8.42	0.65	200	550
		10/9/2018	3620	7.74	0.61	197	602
		11/12/2018	NA	8.05	NA	NA	594

Table 2. Analytical Results - Appendix III Constituents with SSIs

Nelson Dewey Generating Station

Cassville, Wisconsin

Well Group	Well	Collection Date	Boron (µg/L)	Field pH (St. Units)	Fluoride (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
Compliance	B-11R	12/9/2015	4170	7.07	<1 U	75.4	616
		4/13/2016	3410	6.78	<0.2 U	18.4	682
		7/19/2016	3530	6.69	0.22 J	115	698
		10/20/2016	4120	6.77	<0.5 U	118	660
		1/12/2017	3530	6.98	<0.5 U	108	616
		4/17/2017	3520	7.11	<0.5 U	108	620
		6/7/2017	3420	6.8	<0.5 U	98.2	630
		8/1/2017	2040	6.7	0.25 J	126	738
		10/19/2017	3120	7.22	<0.5 U	97.7	586
		4/2/2018	3180	7.14	<0.5 U	88.1	638
		10/9/2018	576	6.55	0.15 J	15.1	266
	B-31A	12/9/2015	59	7.65	<0.2 U	26.2	274
		4/13/2016	79.2	7.63	0.22 J	22.6	302
		7/19/2016	67.2	7.25	<0.2 U	24.2	280
		10/20/2016	63.7	7.54	0.18 J	27.2	292
		1/12/2017	76.4	7.82	0.22 J	29.8	284
		4/17/2017	69.9	7.83	0.19 J	31	318
		6/8/2017	58.5	7.74	0.18 J	31.2	296
		8/1/2017	56.3	7.56	0.2 J	26.6	284
		10/19/2017	63.9	7.92	0.16 J	26.1	290
		4/2/2018	74.8	8.0	0.13 J	27.4	282
		10/9/2018	71.8	7.48	0.17 J	24.8	278
	B-31R	12/9/2015	851	6.79	<0.2 U	28.8	374
		4/13/2016	838	6.76	<0.2 U	34.1	404
		7/19/2016	641	6.44	<0.2 U	38.5	406
		10/20/2016	1020	6.53	0.17 J	49.7	452
		1/12/2017	749	6.8	0.26 J	34.9	380
		4/17/2017	929	6.8	0.12 J	43	416
		6/8/2017	895	6.67	0.13 J	41.1	426
		8/1/2017	1550	6.56	0.16 J	55.6	432
		10/19/2017	645	7.19	0.14 J	19.2	358
		4/2/2018	540	6.76	<0.1U	22	374
		10/9/2018	1430	6.76	<0.1	186.0	668
		11/12/2018	NA	6.41	NA	162.0	596

Table 2. Analytical Results - Appendix III Constituents with SSIs

Nelson Dewey Generating Station

Cassville, Wisconsin

Well Group	Well	Collection Date	Boron (µg/L)	Field pH (St. Units)	Fluoride (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
Compliance	B-7R	12/9/2015	110	6.74	<1 U	17 J	198
		4/13/2016	115	6.8	<0.2 U	2.5 J	218
		7/18/2016	164	6.29	<0.2 U	2.4 J	220
		10/19/2016	154	6.55	<0.5 U	<5 U	288
		1/12/2017	159	7.43	<0.5 U	<5 U	240
		4/17/2017	129	6.6	<0.5 U	<5 U	278
		6/7/2017	110	6.65	<0.5 U	<5 U	240
		8/1/2017	129	6.28	<0.1 U	3.7	220
		10/19/2017	159	6.88	<0.5 U	<5 U	242
		4/2/2018	121	6.57	<0.5 U	<5 U	220
		10/9/2018	73	6.23	<0.1	3.2	186

Abbreviations:

µg/L = micrograms per liter or parts per billion (ppb)

mg/L = milligrams per liter or parts per million (ppm)

Flags:

U = Not detected.

J = Estimated concentration at or above the LOD and below the LOQ.

Created by:	NDK	Date:	3/8/2018
Last revision by:	NAS	Date:	3/6/2019
Checked by:	MDB	Date:	3/27/2019

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Table 3. Groundwater Elevations - State and CCR Monitoring Wells

Nelson Dewey Generating Station

Cassville, Wisconsin

	Ground Water Elevation in feet above mean sea level (amsl)																			
Well Number	**B-7R**	**B-8R**	**B-11R**	**B-11A**	**B-11B**	**B-21R**	**B-26**	**B-26A**	**B-28**	**B-30R**	**B-30AR**	**B-31R**	**B-31A**	**B-32**	**B-32A**	**B-35**	**B-35A**	**B-37**	**B-37A**	**B-39**
Top of Casing Elevation (feet amsl)	623.35	627.51	622.62	622.12	621.89	621.03	626.40	626.40	616.81	621.81	622.4	622.42	622.69	614.18	614.4	620.78	621.2	614.85	614.85	626.48
Screen Length (ft)	10	10	10	5	5	10	10	5	10	10	5	10	5	10	5	10	5	10	5	10
Total Depth (ft from top of casing)	23.05	27.25	24.15	52.00	113.90	20.50	31.67	45.78	16.70	22.20	46.90	22.82	35.52	14.79	52.00	16.60	47.00	19.95	48.20	26.90
Top of Well Screen Elevation (ft)	610.30	610.26	608.47	575.12	512.99	610.53	604.73	585.62	610.11	609.61	580.50	609.60	592.17	609.39	567.40	614.18	579.20	604.90	571.65	609.58
Measurement Date																				
December 8, 2015	606.69	NM	606.71	606.30	606.26	NM	606.80	NM	NM	NM	NM	607.40	606.39	NM	NM	NM	NM	NM	NM	607.54
April 12, 2016	609.32	609.36	609.32	608.71	608.68	NM	609.81	609.72	NM	NM	NM	609.34	609.01	NM	NM	609.73	609.65	608.79	608.79	610.23
July 18-19, 2016	606.54	NM	606.14	606.76	606.74	NM	606.09	NM	NM	NM	NM	606.55	606.73	NM	NM	NM	NM	NM	NM	606.28
October 19-20, 2016	608.59	608.46	608.35	608.21	608.19	608.37	608.84	608.76	608.63	608.45	608.46	608.51	608.20	608.69	608.73	608.78	608.74	608.20	608.18	609.09
January 11-12, 2017	608.02	NM	607.96	607.83	607.78	NM	608.56	NM	NM	NM	NM	607.90	607.84	NM	NM	NM	NM	NM	NM	608.92
April 17, 2017	609.08	608.82	608.34	609.05	608.99	NM	608.59	608.54	609.94	608.57	608.64	607.20	608.98	608.96	608.98	609.00	609.02	609.02	609.02	610.23
June 8, 2017	610.74	NM	610.42	609.81	610.08	NM	611.25	NM	NM	NM	NM	609.63	610.50	NM	NM	NM	NM	NM	NM	611.53
August 1-2, 2017	607.02	NM	606.73	605.57	605.50	NM	607.39	NM	NM	NM	NM	606.84	605.69	NM	NM	NM	NM	NM	NM	608.71
October 9-10, 2017	606.93	606.51	606.25	607.01	606.94	NM	606.22	606.13	606.33	606.44	606.45	606.68	606.93	606.57	606.61	606.65	606.71	NM	NM	NM
October 20, 2017	609.60	NM	609.42	609.58	609.65	NM	608.84	NM	NM	NM	NM	609.47	609.43	NM	NM	NM	NM	609.40	609.40	608.55
April 2-3, 2018	604.82	606.61	606.27	606.63	606.55	606.52	606.49	606.37	NM	NM	NM	604.44	606.46	NM	NM	606.68	606.70	606.77	606.83	NM
October 8-10, 2018	610.76	610.68	610.67	610.28	610.24	NM	610.34	610.28	610.83	610.09	610.05	610.39	610.27	611.05	610.94	610.72	610.54	NM	NM	611.44
November 12, 2018	NM	NM	NM	NM	609.14	NM	NM	NM	NM	NM	NM	609.11	NM	NM	NM	NM	NM	NM	NM	NM
Bottom of Well Elevation (ft)	600.30	600.26	598.47	570.12	507.99	600.53	594.73	580.62	600.11	599.61	575.50	599.60	587.17	599.39	562.40	604.18	574.20	594.90	566.65	599.58

Notes:
NM = not measured

Created by: NDK Date: 3/9/2018
Last revision by: NDK Date: 9/17/2018
Checked by: MDB Date: 3/27/2019

I:\25216071.00\Deliverables\2019 ASD Report 1810- No. 3\Tables\[Tables-NED-1,2, and 3.xlsx]3.GW Elevation

Figures

N

CASSVILLE AND TURKEY RIVER QUADRANGLES
WISCONSIN–IOWA
7.5 MINUTE SERIES (TOPOGRAPHIC)
1978/1980
SCALE: 1" = 2,000'

CLIENT	WISCONSIN POWER AND LIGHT CO. NELSON DEWEY GENERATING STATION 11999 COUNTY HIGHWAY VV CASSVILLE WI, 53806	SITE	WISCONSIN POWER AND LIGHT NELSON DEWEY GENERATING STATION CASSVILLE, WISCONSIN

SITE LOCATION MAP

PROJECT NO.	25216071.17	DRAWN BY:	KP/BJM
DRAWN:	12/18/13	CHECKED BY:	KAK
REVISED:	01/02/18	APPROVED BY:	TK

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

FIGURE 1

I:\2521□071.00\Drawings\Site Location.dwg, 1/23/201□ 12:15:55 PM

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NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS AUGUST 24, 2015.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25216071.17	DRAWN BY:	BJM
DRAWN:	12/18/13	CHECKED BY:	KAK
REVISED:	01/03/18	APPROVED BY:	SCC 04/16/18

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

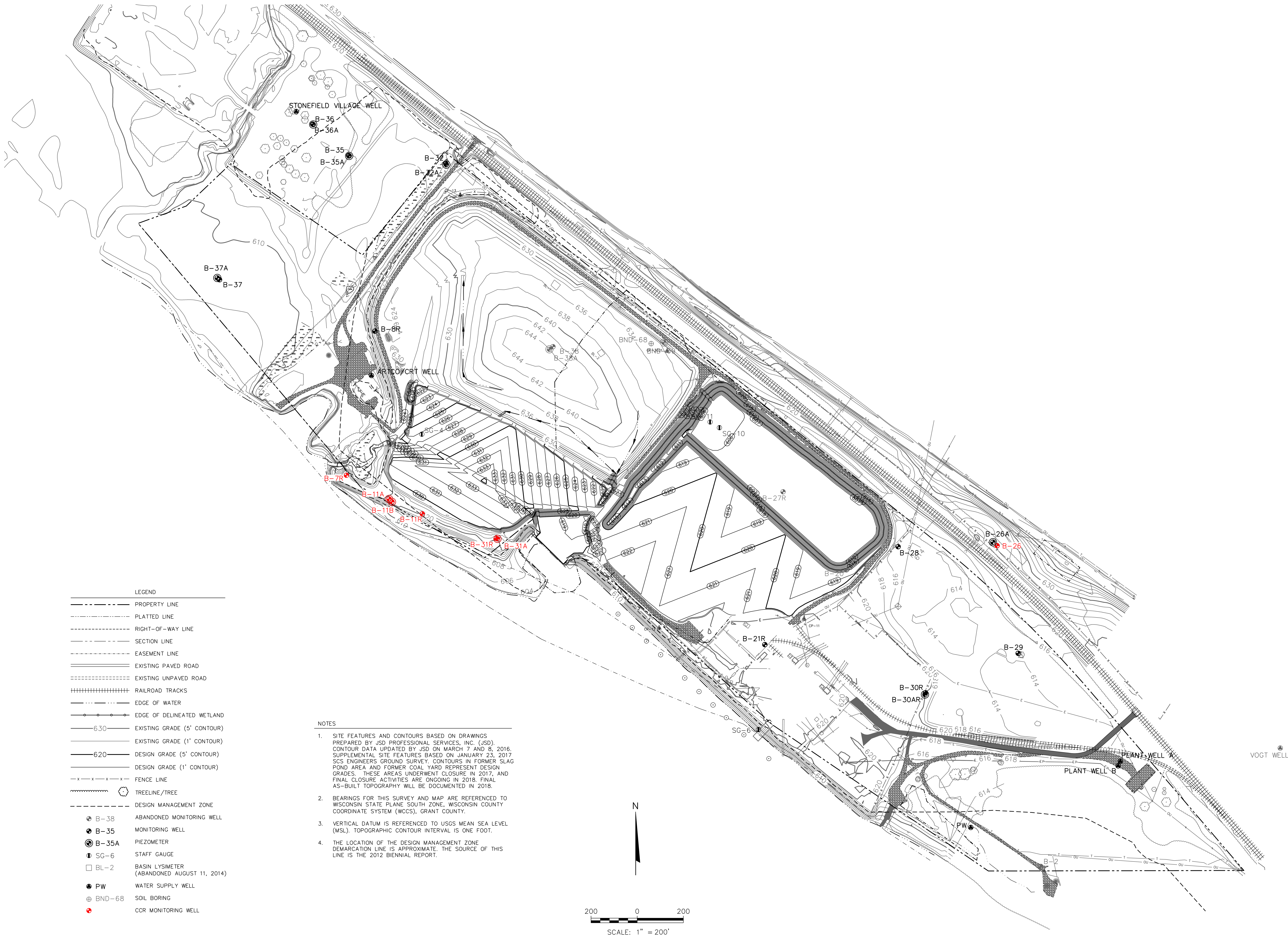
CLIENT: WISCONSIN POWER AND LIGHT CO.
NELSON DEWEY GENERATING STATION
11999 COUNTY HIGHWAY VV
CASSVILLE WI, 53806

SITE: WISCONSIN POWER AND LIGHT
NELSON DEWEY GENERATING STATION
CASSVILLE WISCONSIN

AERIAL VIEW

FIGURE 2

I:\2521□071.00\Drawings\□elson Dewe□Alternati□e Source De□onstration Report\Site Aerial.dwg, 4/1□/201□3:5□:2□PM



LEGEND

- PROPERTY LINE
- PLATTED LINE
- RIGHT-OF-WAY LINE
- SECTION LINE
- EASEMENT LINE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- RAILROAD TRACKS
- EDGE OF WATER
- EDGE OF DELINEATED WETLAND
- 630 EXISTING GRADE (5' CONTOUR)
- EXISTING GRADE (1' CONTOUR)
- 620 DESIGN GRADE (5' CONTOUR)
- DESIGN GRADE (1' CONTOUR)
- FENCE LINE
- TREELINE/TREE
- DESIGN MANAGEMENT ZONE
- B-38 ABANDONED MONITORING WELL
- B-35 MONITORING WELL
- B-35A PIEZOMETER
- SG-6 STAFF GAUGE
- BL-2 BASIN LYSIMETER (ABANDONED AUGUST 11, 2014)
- PW WATER SUPPLY WELL
- BND-68 SOIL BORING
- CCR MONITORING WELL

NOTES

1. SITE FEATURES AND CONTOURS BASED ON DRAWINGS PREPARED BY JSD PROFESSIONAL SERVICES, INC. (JSD). CONTOUR DATA UPDATED BY JSD ON MARCH 7 AND 8, 2016. SUPPLEMENTAL SITE FEATURES BASED ON JANUARY 23, 2017 SCS ENGINEERS GROUND SURVEY. CONTOURS IN FORMER SLAG POND AREA AND FORMER COAL YARD REPRESENT DESIGN GRADES. THESE AREAS UNDERWENT CLOSURE IN 2017, AND FINAL CLOSURE ACTIVITIES ARE ONGOING IN 2018. FINAL AS-BUILT TOPOGRAPHY WILL BE DOCUMENTED IN 2018.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO WISCONSIN STATE PLANE SOUTH ZONE, WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), GRANT COUNTY.
3. VERTICAL DATUM IS REFERENCED TO USGS MEAN SEA LEVEL (MSL). TOPOGRAPHIC CONTOUR INTERVAL IS ONE FOOT.
4. THE LOCATION OF THE DESIGN MANAGEMENT ZONE DEMARCATION LINE IS APPROXIMATE. THE SOURCE OF THIS LINE IS THE 2012 BIENNIAL REPORT.

PROJECT NO.	25216071.17	DRAWN BY:	KP/BJM
DRAWN:	01/13/14	CHECKED BY:	NK
REVISED:	03/14/18	APPROVED BY:	SCC 4/16/18

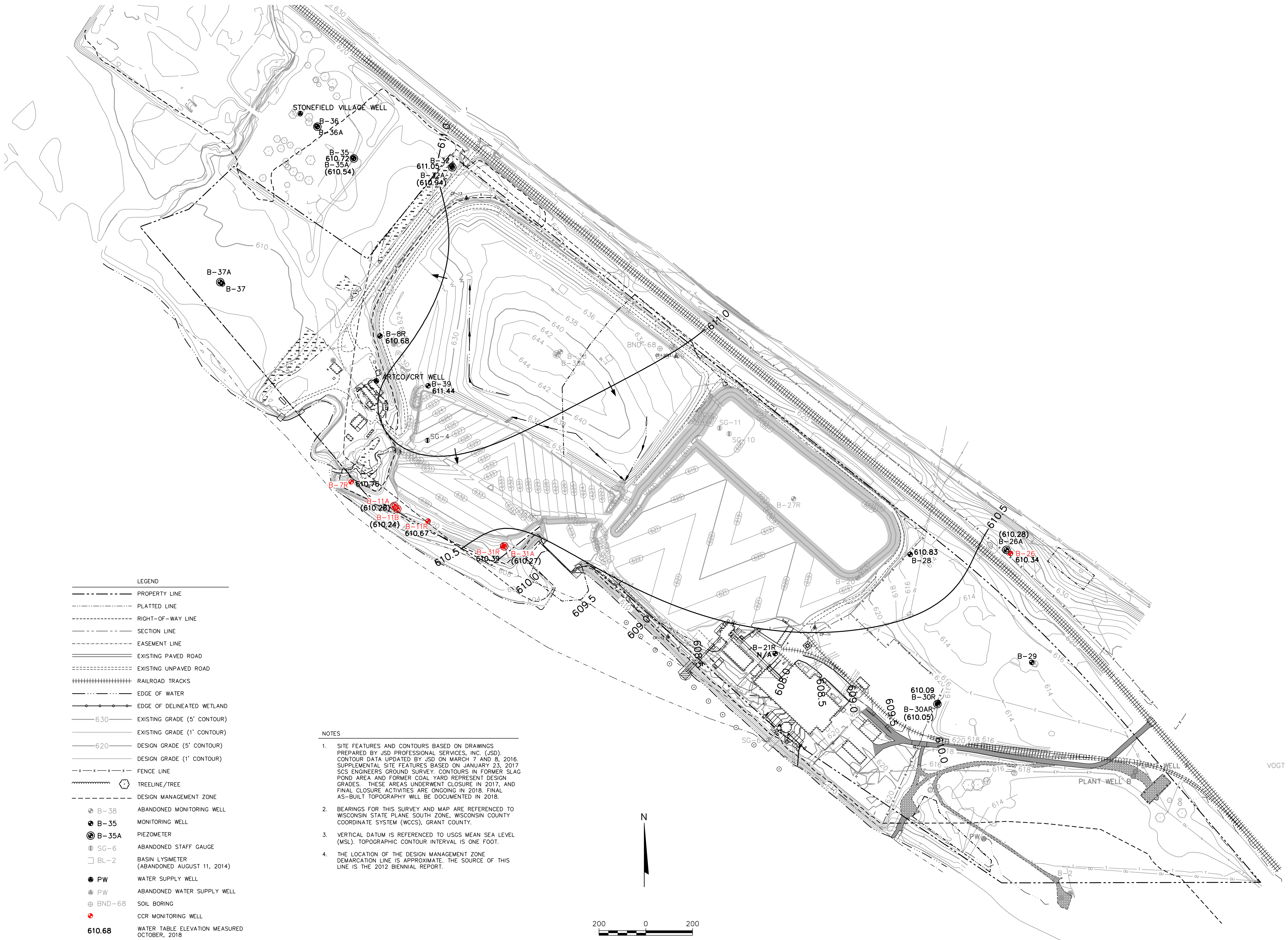
ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: WISCONSIN POWER AND LIGHT CO.
NELSON DEWEY GENERATING STATION
11999 COUNTY HIGHWAY VV
CASSVILLE, WI 53806

SITE: WISCONSIN POWER AND LIGHT
NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

MONITORING WELL LOCATION MAP

FIGURE 3



LEGEND

- PROPERTY LINE
- PLATTED LINE
- RIGHT-OF-WAY LINE
- SECTION LINE
- EASEMENT LINE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- RAILROAD TRACKS
- EDGE OF WATER
- EDGE OF DELINEATED WETLAND
- 630 — EXISTING GRADE (5' CONTOUR)
- EXISTING GRADE (1' CONTOUR)
- 620 — DESIGN GRADE (5' CONTOUR)
- DESIGN GRADE (1' CONTOUR)
- FENCE LINE
- TREELINE/TREE
- DESIGN MANAGEMENT ZONE
- B-38 ABANDONED MONITORING WELL
- B-35 MONITORING WELL
- B-35A PIEZOMETER
- SG-6 ABANDONED STAFF GAUGE
- BL-2 BASIN LYSIMETER (ABANDONED AUGUST 11, 2014)
- PW WATER SUPPLY WELL
- PW ABANDONED WATER SUPPLY WELL
- BND-68 SOIL BORING
- CCR MONITORING WELL
- 610.68 WATER TABLE ELEVATION MEASURED OCTOBER, 2018
- 611 WATER TABLE CONTOUR
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES

1. SITE FEATURES AND CONTOURS BASED ON DRAWINGS PREPARED BY JSD PROFESSIONAL SERVICES, INC. (JSD). CONTOUR DATA UPDATED BY JSD ON MARCH 7 AND 8, 2016. SUPPLEMENTAL SITE FEATURES BASED ON JANUARY 23, 2017 SCS ENGINEERS GROUND SURVEY. CONTOURS IN FORMER SLAG POND AREA AND FORMER COAL YARD REPRESENT DESIGN GRADES. THESE AREAS UNDERWENT CLOSURE IN 2017, AND FINAL CLOSURE ACTIVITIES ARE ONGOING IN 2018. FINAL AS-BUILT TOPOGRAPHY WILL BE DOCUMENTED IN 2018.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO WISCONSIN STATE PLANE SOUTH ZONE, WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), GRANT COUNTY.
3. VERTICAL DATUM IS REFERENCED TO USGS MEAN SEA LEVEL (MSL). TOPOGRAPHIC CONTOUR INTERVAL IS ONE FOOT.
4. THE LOCATION OF THE DESIGN MANAGEMENT ZONE DEMARCATION LINE IS APPROXIMATE. THE SOURCE OF THIS LINE IS THE 2012 BIENNIAL REPORT.

200 0 200

SCALE: 1" = 200'

PROJECT NO.	25216071.18	DRAWN BY:	KP/BSS
DRAWN:	03/14/19	CHECKED BY:	NK
REVISED:	03/28/19	APPROVED BY:	TK 04/09/19

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: WISCONSIN POWER AND LIGHT CO.
NELSON DEWEY GENERATING STATION
11999 COUNTY HIGHWAY VV
CASSVILLE, WI 53806

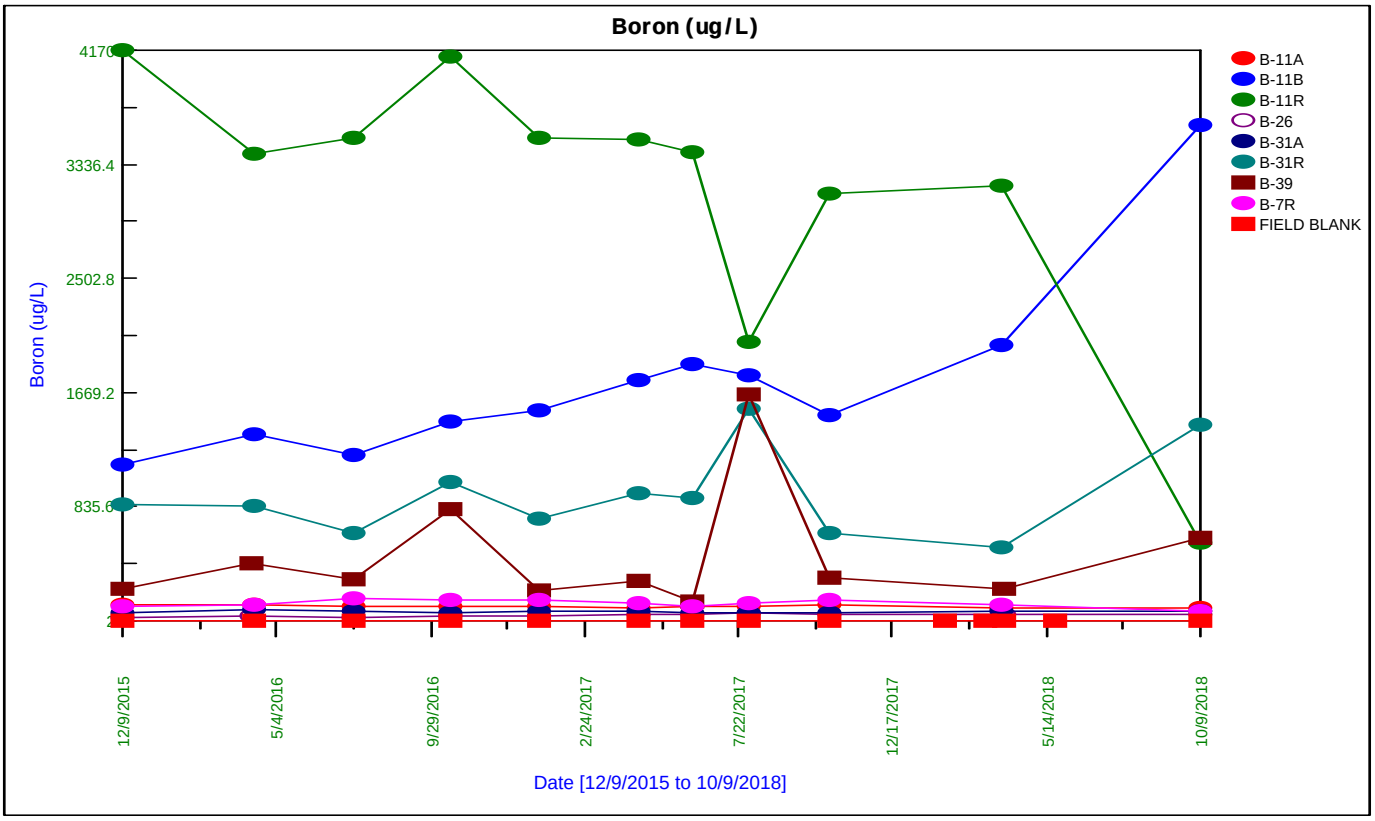
SITE: WISCONSIN POWER AND LIGHT
NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

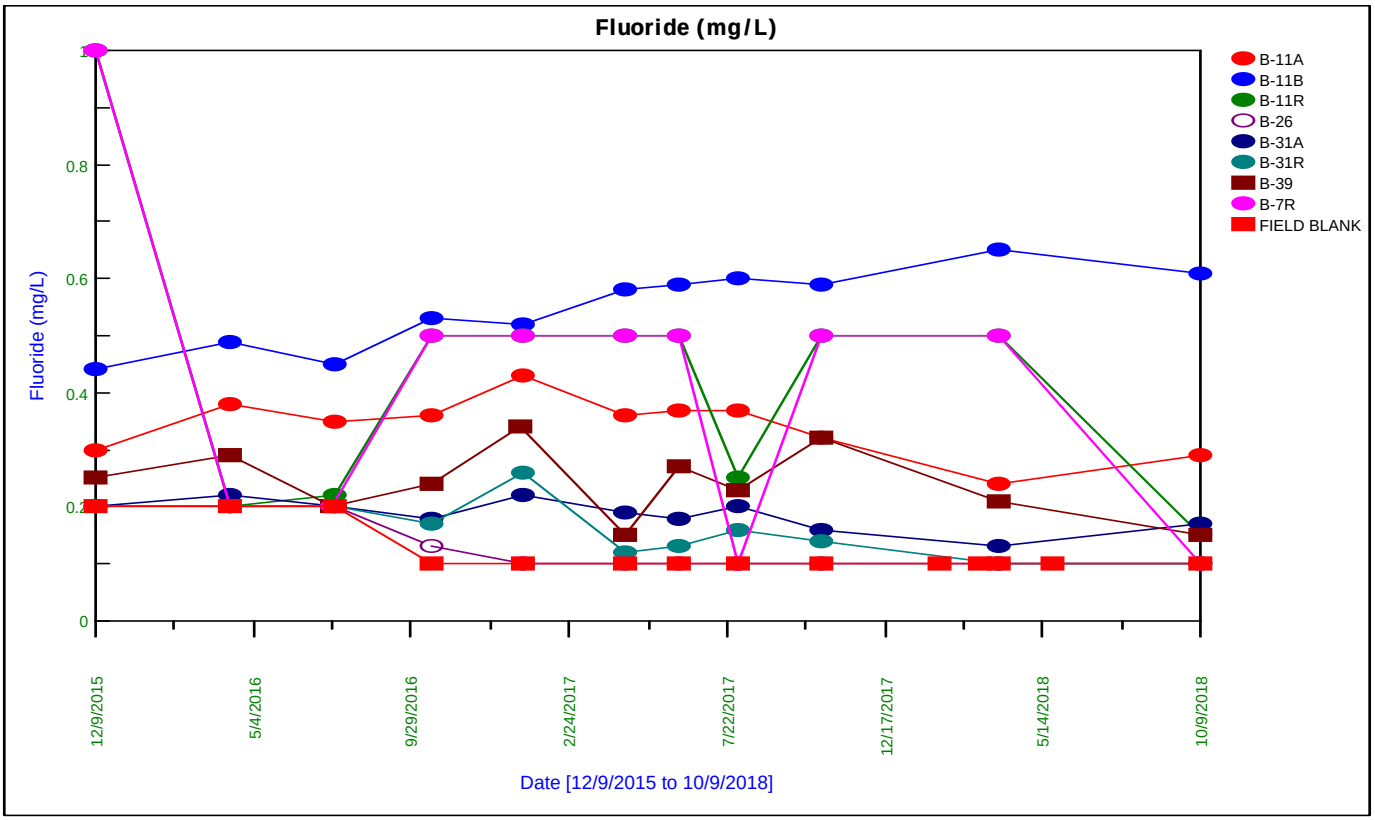
WATER TABLE FLOW MAP
OCTOBER 2018

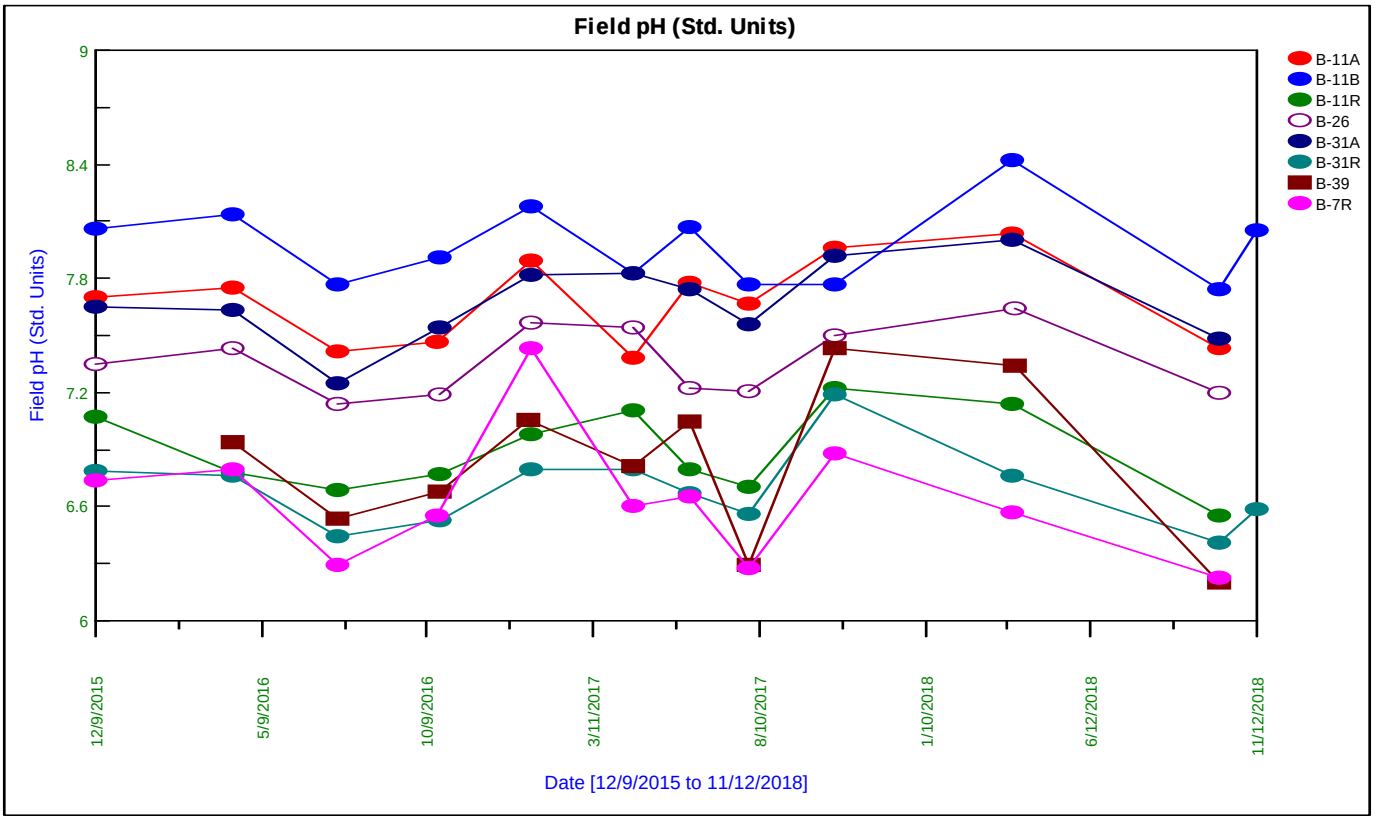
FIGURE 4

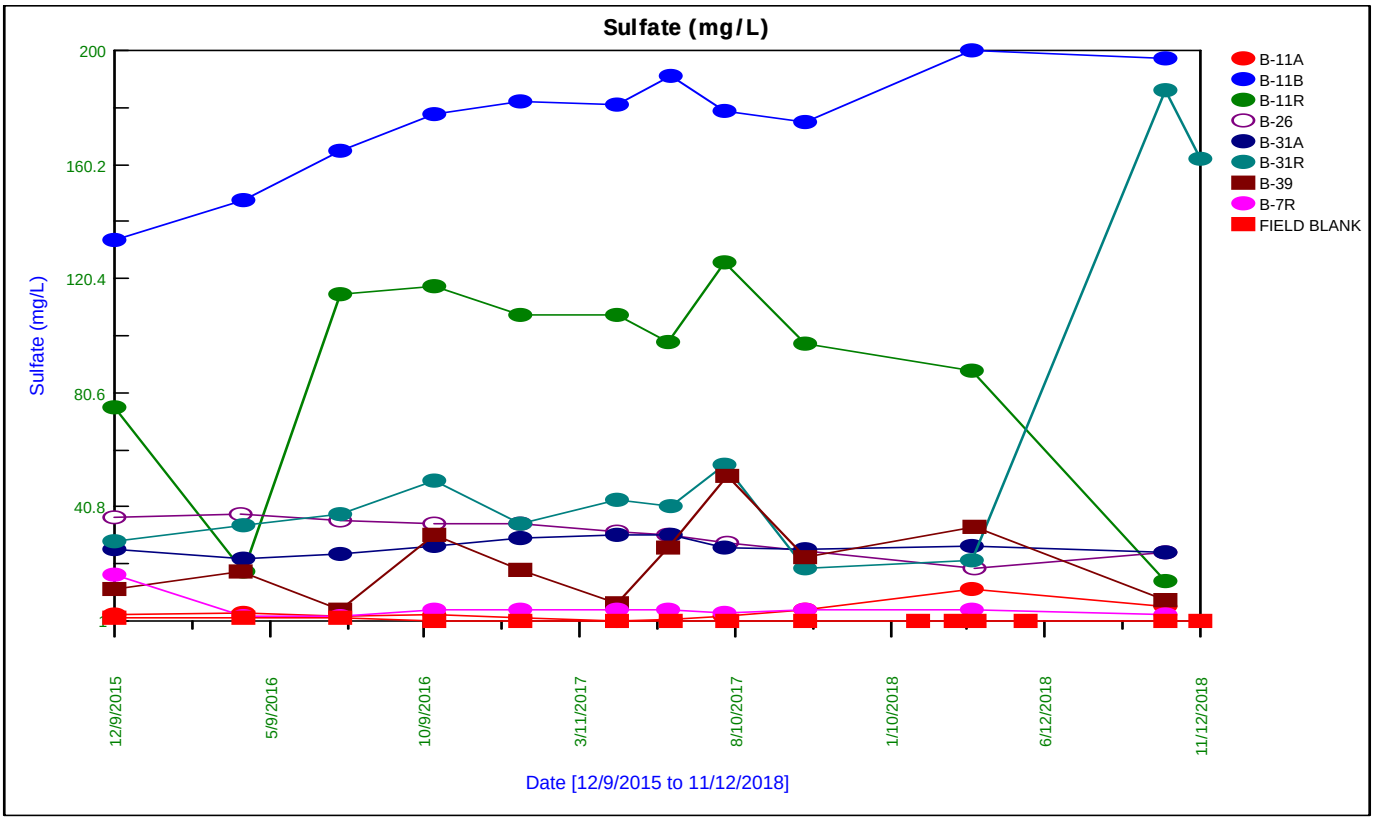
Appendix A

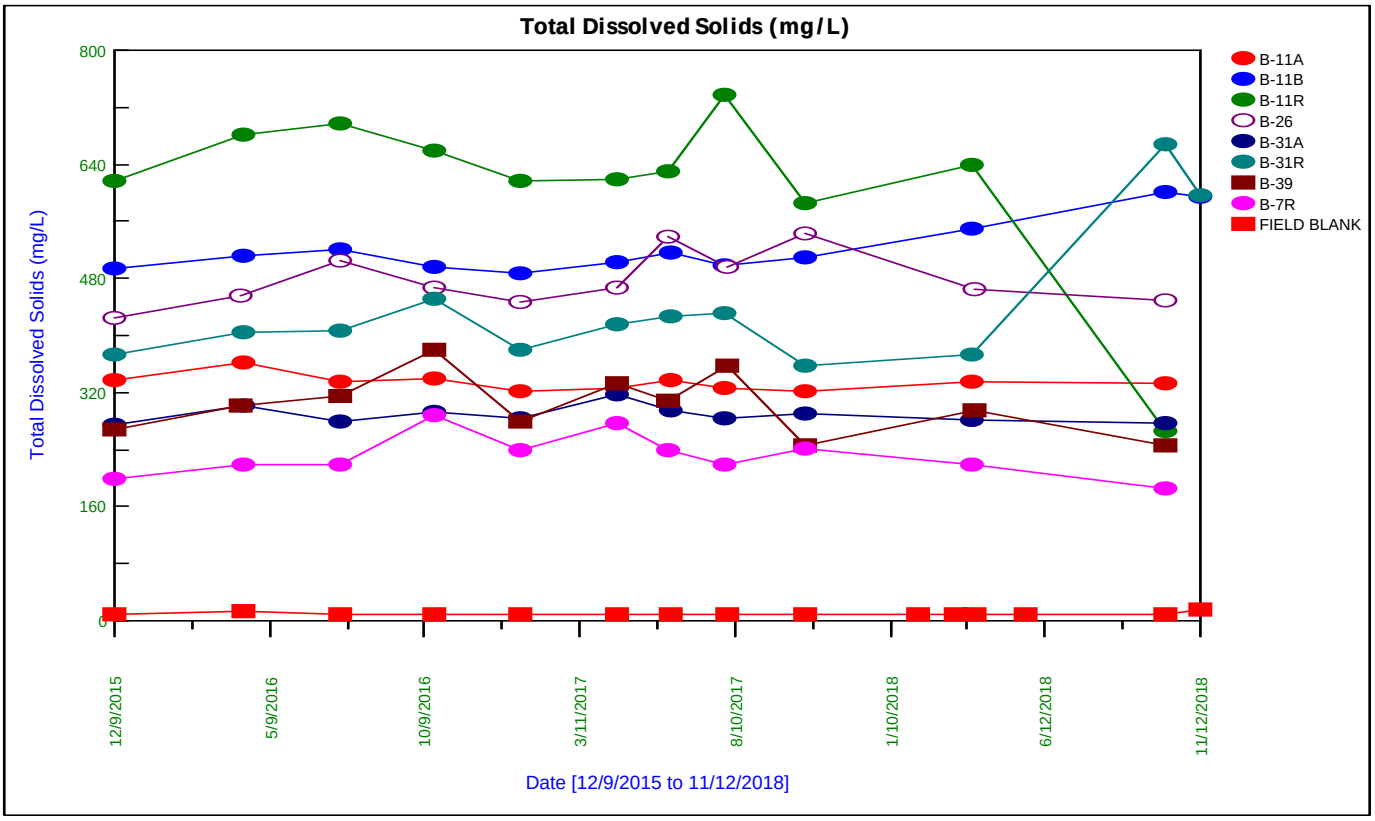
CCR Well Trend Plots


Boron (ug/L)
4170
3336.4
2502.8
1669.2
835.6
Boron (ug/L)
12/9/2015
5/4/2016
9/29/2016
2/24/2017
7/22/2017
12/17/2017
5/14/2018
10/9/2018
Date [12/9/2015 to 10/9/2018]
B-11A
B-11B
B-11R
B-26
B-31A
B-31R
B-39
B-7R
FIELD BLANK


Fluoride (mg/L)
0.8
0.6
0.4
0
Fluoride (mg/L)
12/9/2015
5/4/2016
9/29/2016
2/24/2017
7/22/2017
12/17/2017
5/14/2018
10/9/2018
Date [12/9/2015 to 10/9/2018]
B-11A
B-11B
B-11R
B-26
B-31A
B-31R
B-39
B-7R
FIELD BLANK

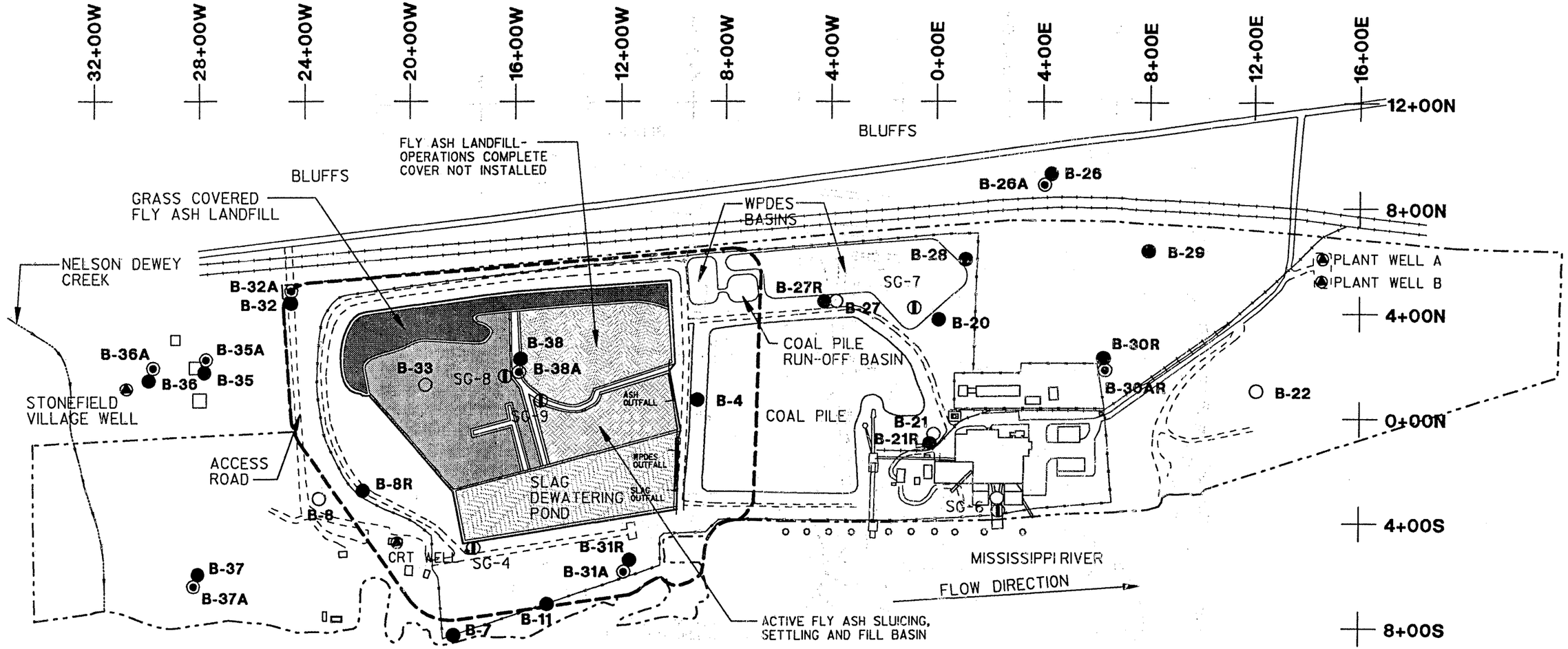

Field pH (Std. Units)
9
8.4
7.8
7.2
6.6
6
Field pH (Std. Units)
12/9/2015
5/9/2016
10/9/2016
3/11/2017
8/10/2017
1/10/2018
6/12/2018
11/12/2018
Date [12/9/2015 to 11/12/2018]
B-11A
B-11B
B-11R
B-26
B-31A
B-31R
B-39
B-7R


Sulfate (mg/L)
200
160.2
120.4
80.6
40.8
Sulfate (mg/L)
12/9/2015
5/9/2016
10/9/2016
3/11/2017
8/10/2017
1/10/2018
6/12/2018
11/12/2018
Date [12/9/2015 to 11/12/2018]
B-11A
B-11B
B-11R
B-26
B-31A
B-31R
B-39
B-7R
FIELD BLANK


Total Dissolved Solids (mg/L)
800
640
480
320
160
0
Total Dissolved Solids (mg/L)
12/9/2015
5/9/2016
10/9/2016
3/11/2017
8/10/2017
1/10/2018
6/12/2018
11/12/2018
Date [12/9/2015 to 11/12/2018]
B-11A
B-11B
B-11R
B-26
B-31A
B-31R
B-39
B-7R
FIELD BLANK

Appendix B

1994 RMT Environmental Contamination Assessment Information



LEGEND

● B-28	WATER TABLE OBSERVATION WELL
◉ B-28A	PIEZOMETER
○ B-33	ABANDONED WELL
▲ CRT WELL	WATER SUPPLY WELL
◐ SG-4	STAFF GAUGE
———	APPROXIMATE LIMITS OF LICENSED LANDFILL
——+——+——	RAILROAD TRACK
= = = = =	ROAD
— - — - —	PROPERTY LINE
— — — —	DESIGN MANAGEMENT ZONE
+ 0+00E	LOCAL GRID
□	BUILDINGS
o	PILINGS

NOTES

1. BASE MAP WELLHEAD LOCATIONS SURVEYED BY SCHMITT ENGINEERING IN OCTOBER 1993.
2. OTHER SITE INFORMATION PROVIDED BY WP&L.

TRUE

0 400 800

SCALE: 1"=400'

WISCONSIN POWER & LIGHT
NELSON DEWEY GENERATING STATION
EXISTING CONDITIONS
OCTOBER 1993

RMT, INC.

Dwn.By:	CDH
Approved By:	ELM
Date:	OCTOBER 1994
Proj.#:	2767.03
File #:	2767030LDGN

Plot File = P:\MSPC\2767030\DGN\2767030LDGN
Plot Date = Fri Oct 21 08:28:28 1994
Pen Table =DEFAULT.TBL

OCT 31 1994

FIGURE 4

TABLE 5

SUMMARY OF LEACHING TEST RESULTS

	Fly Ash		Slag
Year	1983	1990 to 1992	1987 to 1992
Coal Type	Eastern (and Western)	Western (and Eastern)	Western (and Eastern) [1]
Water:Solid Ratio	2:1	4:1	4:1
Extraction Time	24 hours	48 hours	48 hours
Number of Samples	1	3	6
Arsenic (mg/L)	< 0.001	0.05 to 2.02	< 0.002 to 0.081
Selenium (mg/L)	NA	0.42 to 160	< 0.002 to 0.045
Boron (mg/L)	420	4.63 to 37.34	< 0.010 to 1.05
Iron (mg/L)	NA	NA	< 0.02 to 0.98
Sulfate (mg/L)	13,070	2,000 to 16,700	2.0 to < 5.0
pH (SU)	6.6	10.3 to 12.5	5.6 to 9.9

NOTES:

1. 1983 fly ash leaching data from RMT (1984); remaining leaching data provided by WP&L.
2. NA = Not Analyzed.

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 07-SEP-93

TABLE 6
SLAG AND ASH BASIN CHEMISTRY

PARAMETER	UNITS	FLY ASH BASIN 07-SEP-93 3302-011		SLAG BASIN 07-SEP-93 3302-010	
COLOR, FIELD		CLEAR		CLEAR	
CONDUCTANCE, SPECIFIC	UMHOS/CM	5190		400	
ODOR, FIELD		NONE		NONE	
PH, FIELD	SU	8.1		7.4	
TEMPERATURE	DEG C	17		18	
TURBIDITY, FIELD		SLIGHT		SLIGHT	
ALKALINITY AS CACO3	MG/L	230		160	
HARDNESS AS CACO3	MG/L	930		200	
SOLIDS, TOTAL DISSOLVED	MG/L	410		300	
SULFATE	MG/L	3300		50	
ARSENIC, TOTAL	UG/L	60		8.0	
BARIUM, TOTAL	UG/L	270		150	
BORON, TOTAL	UG/L	2300		210	
CADMIUM, TOTAL	UG/L	5.4		< 0.30	
CHROMIUM, TOTAL	UG/L	11		< 10	
IRON, TOTAL	UG/L	1600		2000	
LEAD, TOTAL	UG/L	< 3.0		< 3.0	
MERCURY, TOTAL	UG/L	< 0.20		< 0.20	
SELENIUM, TOTAL	UG/L	36	I	2.1	L
SILVER, TOTAL	UG/L	< 1.0		< 1.0	

wpvalid:SWI.BJC

18-OCT-94

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-04 01-JUN-93 1670-015	B-04 07-SEP-93 3293-010	B-07 ND 01-JUN-93 1670-020	B-07 ND 07-SEP-93 3302-004	B-08 01-JUN-93 1670-001	B-08R 07-SEP-93 3293-009
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	1160	1240	460	550	670	1160
DEPTH TO WATER	FEET	9.90	12.75	12.83	16.12	5.68	20.13
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.3	7.5	7.0	6.9	7.1	6.8
TEMPERATURE	DEG C	15	10	14	12	15	7
TURBIDITY, FIELD		NONE	SLIGHT	NONE	SLIGHT	NONE	MODERATE
WATER ELEVATION	FEET	610.68	607.83	610.97	607.68	610.51	
ALKALINITY AS CACO3	MG/L	72	92	160	190	220	440
CHLORIDE	MG/L	18	23	17	15	9.4	2.8
COD	MG/L						
FLUORIDE	MG/L	0.58	5.5	0.26	0.32	< 0.10	0.12
HARDNESS AS CACO3	MG/L	220	120	210	250	370	620
NITROGEN, NITRATE + NITRITE	MG/L	0.15	0.33	< 0.050	< 0.050	< 0.050	4.2
SOLIDS, TOTAL DISSOLVED	MG/L	900	940	300	360	460	770
SULFATE	MG/L	500	560	74	100	180	180
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L	68	< 50	61	73	63	50
BORON, DISSOLVED	UG/L	1900	4200	230	< 200	2200	9400
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	0.38
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20
IRON, DISSOLVED	UG/L	720	890	2800	4100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	1200	720	970	1500	17	3400
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	6.9	3.2	< 1.0 L	< 1.0 L	< 1.0 L	34
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	1000	100	22	< 20	220	< 20

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-11 07-SEP-93 X0001	B-11 29-OCT-93 3485-001	B-20 07-SEP-93 X0002	B-26 01-JUN-93 1670-022	B-26 07-SEP-93 3302-005	B-26A 01-JUN-93 1670-023
COLOR, FIELD					CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	1500		310	610	670	660
DEPTH TO WATER	FEET	15.91		10.81	16.22	18.85	16.20
ODOR, FIELD					NONE	NONE	NONE
PH, FIELD	SU				7.1	7.2	7.0
TEMPERATURE	DEG C	13	13	14	14	11	15
TURBIDITY, FIELD					NONE	SLIGHT	NONE
WATER ELEVATION	FEET				610.18	607.55	610.19
ALKALINITY AS CACO3	MG/L		470		320	300	340
CHLORIDE	MG/L				21	43	33
COD	MG/L						
FLUORIDE	MG/L				< 0.10	0.15	< 0.10
HARDNESS AS CACO3	MG/L		810		390	410	400
NITROGEN, NITRATE + NITRITE	MG/L				2.6	4.9	2.0
SOLIDS, TOTAL DISSOLVED	MG/L		520		440	450	450
SULFATE	MG/L		360		34	34	33
ARSENIC, DISSOLVED	UG/L		8.4		< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L		100		62	68	96
BORON, DISSOLVED	UG/L		5100		< 200	< 200	< 200
CADMIUM, DISSOLVED	UG/L		< 0.30		< 0.30	< 0.30	< 0.30
CHROMIUM, DISSOLVED	UG/L		< 10		< 10	< 10	< 10
COPPER, DISSOLVED	UG/L				< 20	< 20	< 20
IRON, DISSOLVED	UG/L		55000		< 100	< 100	< 100
LEAD, DISSOLVED	UG/L		< 3.0		< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L				< 5.0	< 5.0	< 5.0
MERCURY, DISSOLVED	UG/L		< 0.20		< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L		< 1.0 LNP		< 1.0 L	< 1.0 L	< 1.0 L
SILVER, DISSOLVED	UG/L		< 10		< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L				< 20	< 20	< 20

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-26A 07-SEP-93 3302-006	B-27R 07-SEP-93 X0003	B-28 01-JUN-93 1670-014	B-28 07-SEP-93 3302-003	B-29 07-SEP-93 X0004	B-30AR 01-JUN-93 1670-013
COLOR, FIELD		CLEAR		CLEAR	CLEAR		CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	440	370	190	230	360	220
DEPTH TO WATER	FEET	18.84	14.67	6.40	9.08	9.57	12.33
ODOR, FIELD		NONE		NONE	NONE		NONE
PH, FIELD	SU	7.2		6.1	6.0		7.2
TEMPERATURE	DEG C	11	14	17	15	15	17
TURBIDITY, FIELD		NONE		SLIGHT	MODERATE		NONE
WATER ELEVATION	FEET	607.55		610.46	607.74	607.26	610.11
ALKALINITY AS CACO3	MG/L	340		26	54		200
CHLORIDE	MG/L	25		4.6	11		13
COD	MG/L						7.3
FLUORIDE	MG/L	0.15		< 0.10	< 0.10		0.10
HARDNESS AS CACO3	MG/L	410		82	110		220
NITROGEN, NITRATE + NITRITE	MG/L	1.8		2.7	0.60		< 0.050
SOLIDS, TOTAL DISSOLVED	MG/L	440		140	160		280
SULFATE	MG/L	38		45	42		27
ARSENIC, DISSOLVED	UG/L	< 3.0		< 3.0	< 3.0		< 3.0
BARIUM, DISSOLVED	UG/L	86		< 50	52		< 50
BORON, DISSOLVED	UG/L	< 200		< 200	< 200		< 200
CADMIUM, DISSOLVED	UG/L	< 0.30		< 0.30	< 0.30		< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10		< 10	< 10		< 10
COPPER, DISSOLVED	UG/L	< 20		< 20	< 20		< 20
IRON, DISSOLVED	UG/L	< 100		210	< 100		< 100
LEAD, DISSOLVED	UG/L	< 3.0		< 3.0	< 3.0		< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0		8.6	< 5.0		< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20		< 0.20	< 0.20		< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 LN		< 1.0 L	< 1.0 L		< 1.0 L
SILVER, DISSOLVED	UG/L	< 1.0		< 1.0	< 1.0		< 1.0
ZINC, DISSOLVED	UG/L	< 20		< 20	< 20		< 20

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-30AR 07-SEP-93 3302-002	B-30R 01-JUN-93 1670-012	B-30R 07-SEP-93 3302-001	B-31A 01-JUN-93 1670-019	B-31A 07-SEP-93 3293-011	B-31R 01-JUN-93 1670-018
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	410	420	360	700	800	640
DEPTH TO WATER	FEET	15.37	12.25	15.17	12.21	15.93	11.56
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.3	7.0	6.8	6.9	7.3	6.8
TEMPERATURE	DEG C	12	16	14	17	14	17
TURBIDITY, FIELD		NONE	MODERATE	MODERATE	NONE	SLIGHT	SLIGHT
WATER ELEVATION	FEET	607.07	610.10	607.18	610.46	606.74	610.85
ALKALINITY AS CACO3	MG/L	190	160	140	170	160	240
CHLORIDE	MG/L	14	13	6.6	16	17	11
COD	MG/L		9.7				
FLUORIDE	MG/L	0.16	< 0.10	< 0.10	0.39	0.43	< 0.10
HARDNESS AS CACO3	MG/L	230	210	210	120	160	330
NITROGEN, NITRATE + NITRITE	MG/L	< 0.050	8.5	8.8	< 0.050	< 0.050	< 0.050
SOLIDS, TOTAL DISSOLVED	MG/L	280	280	230	510	570	510
SULFATE	MG/L	25	25	26	250	250	150
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L	< 50	< 50	< 50	54	66	110
BORON, DISSOLVED	UG/L	< 200	< 200	< 200	2900	2100	2900
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	2.7
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	110
IRON, DISSOLVED	UG/L	< 100	< 100	< 100	210	300	450
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0	< 5.0	< 5.0	4600	6000	440
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	1.3 L	3.2	< 1.0 L	< 1.0 L	1.2 L
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	27

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-31R 07-SEP-93 3293-012	B-32 01-JUN-93 1670-002	B-32 07-SEP-93 3293-016	B-32A 01-JUN-93 1670-003	B-32A 07-SEP-93 3293-017	B-35 01-JUN-93 1670-004
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	L YLW/BN
CONDUCTANCE, SPECIFIC	UMHOS/CM	480	300	330	610	1320	1070
DEPTH TO WATER	FEET	14.44	3.37	6.22	3.59	6.46	10.10
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.0	6.3	5.6	7.0	6.8	6.3
TEMPERATURE	DEG C	15	13	14	13	14	12
TURBIDITY, FIELD		MODERATE	SLIGHT	MODERATE	NONE	SLIGHT	SLIGHT
WATER ELEVATION	FEET	607.97	610.80	607.95	610.81	607.94	610.66
ALKALINITY AS CACO3	MG/L	190	140	140	330	320	190
CHLORIDE	MG/L	11	6.7	6.9	7.0	7.6	110
COD	MG/L						
FLUORIDE	MG/L	0.18	< 0.10	0.12	0.12	0.19	< 0.10
HARDNESS AS CACO3	MG/L	240	160	180	350	390	260
NITROGEN, NITRATE + NITRITE	MG/L	< 0.050	0.68	1.2	1.1	1.3	36
SOLIDS, TOTAL DISSOLVED	MG/L	340	200	240	380	420	800
SULFATE	MG/L	71	11	16	29	30	35
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	7.4
BARIUM, DISSOLVED	UG/L	81	100	120	98	91	100
BORON, DISSOLVED	UG/L	1100	< 200	< 200	< 200	< 200	210
CADMIUM, DISSOLVED	UG/L	1.1	< 0.30	0.38	< 0.30	0.35	< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	21
IRON, DISSOLVED	UG/L	210	< 100	< 100	< 100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	360	< 5.0	280	6.9	33	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	< 1.0 L	< 1.0 L	< 1.0 L	< 1.0 L	< 1.0 L
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-35 07-SEP-93 3293-002	B-35A 01-JUN-93 1670-005	B-35A 07-SEP-93 3293-003	B-36 01-JUN-93 1670-007	B-36 07-SEP-93 3293-004	B-36A 01-JUN-93 1670-006
COLOR, FIELD		YELLOW	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	1050	620	680	430	500	620
DEPTH TO WATER	FEET	13.13	10.55	13.57	10.86	13.97	11.11
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	6.8	7.0	7.1	6.3	7.0	7.1
TEMPERATURE	DEG C	14	13	12	12	13	13
TURBIDITY, FIELD		SLIGHT	NONE	NONE	SLIGHT	MODERATE	NONE
WATER ELEVATION	FEET	607.63	610.63	607.61	610.60	607.49	610.35
ALKALINITY AS CACO3	MG/L	210	330	320	230	210	330
CHLORIDE	MG/L	80	26	24	4.4	25	12
COD	MG/L						
FLUORIDE	MG/L	0.19	< 0.10	0.13	< 0.10	0.14	< 0.10
HARDNESS AS CACO3	MG/L	290	380	400	240	280	350
NITROGEN, NITRATE + NITRITE	MG/L	39	1.7	2.0	< 0.050	1.4	0.83
SOLIDS, TOTAL DISSOLVED	MG/L	770	480	460	280	350	400
SULFATE	MG/L	43	33	37	15	18	36
ARSENIC, DISSOLVED	UG/L	3.6	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L	120	< 50	54	110	120	68
BORON, DISSOLVED	UG/L	220	< 200	< 200	< 200	< 200	< 200
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	24	< 20	< 20	< 20	< 20	< 20
IRON, DISSOLVED	UG/L	< 100	< 100	< 100	< 100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0	< 5.0	< 5.0	< 5.0	55	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	< 1.0 L	< 1.0 L	1.0 L	2.6 L	< 1.0 L
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-36A 07-SEP-93 3293-005	B-37 07-SEP-93 3302-007	B-37A 07-SEP-93 3302-008	B-38 01-JUN-93 1670-016	B-38 07-SEP-93 3293-006	B-38A 01-JUN-93 1670-017
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	620	510	770	3630	2830	2760
DEPTH TO WATER	FEET	14.18	8.13	8.14	18.53	20.19	24.87
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.1	7.3	7.3	8.3	9.9	7.7
TEMPERATURE	DEG C	11	13	11	20	20	15
TURBIDITY, FIELD		NONE	SLIGHT	NONE	NONE	SLIGHT	NONE
WATER ELEVATION	FEET	607.51	606.69	606.69	617.29	615.63	610.96
ALKALINITY AS CACO3	MG/L	330	200	190	100	420	80
CHLORIDE	MG/L	13	6.8	11	26	24	23
COD	MG/L						
FLUORIDE	MG/L	0.14	< 0.10	< 0.10	1.8	2.6	1.1
HARDNESS AS CACO3	MG/L	390	290	410	620	21	500
NITROGEN, NITRATE + NITRITE	MG/L	0.85	1.2	< 0.050	1.7	0.29	1.6
SOLIDS, TOTAL DISSOLVED	MG/L	420	380	590	3000	2200	2300
SULFATE	MG/L	36	100	240	2600	1200	2000
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	180	90	38
BARIUM, DISSOLVED	UG/L	68	< 50	< 50	110	< 50	58
BORON, DISSOLVED	UG/L	< 200	3100	7400	2500	2600	2200
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	68	< 10	52
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20
IRON, DISSOLVED	UG/L	< 100	< 100	< 100	< 100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0	< 5.0	55	< 5.0	< 5.0	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	< 1.0 L	< 1.0 L	57	320	22
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-38A 07-SEP-93 3293-007
COLOR, FIELD		CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	3280
DEPTH TO WATER	FEET	27.59
ODOR, FIELD		NONE
PH, FIELD	SU	9.0
TEMPERATURE	DEG C	16
TURBIDITY, FIELD		NONE
WATER ELEVATION	FEET	608.24
ALKALINITY AS CACO3	MG/L	90
CHLORIDE	MG/L	21
COD	MG/L	
FLUORIDE	MG/L	3.4
HARDNESS AS CACO3	MG/L	390
NITROGEN, NITRATE + NITRITE	MG/L	0.59
SOLIDS, TOTAL DISSOLVED	MG/L	2600
SULFATE	MG/L	1800
ARSENIC, DISSOLVED	UG/L	51
BARIUM, DISSOLVED	UG/L	54
BORON, DISSOLVED	UG/L	3300
CADMIUM, DISSOLVED	UG/L	< 0.30
CHROMIUM, DISSOLVED	UG/L	11
COPPER, DISSOLVED	UG/L	< 20
IRON, DISSOLVED	UG/L	< 100
LEAD, DISSOLVED	UG/L	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20
SELENIUM, DISSOLVED	UG/L	57
SILVER, DISSOLVED	UG/L	< 1.0
ZINC, DISSOLVED	UG/L	< 20

Appendix C

2016 Low-Hazard Waste Exemption Leaching Test Results – Slag and Ash

Sediment and Soil Analytical Results - Water Leach Test Results
WPL Nelson Dewey

Sample	Date	Depth (feet)	Material Type	Lab Notes	Boron (ug/L)	Calcium (ug/L)	Fluoride (mg/L)	Sulfate (mg/L)
WPDES POND								
SED-1	8/3/2016	0-1.3	Fly Ash	--	240	6,100	<1.0	4.4
SED-2	8/3/2016	0-1.0	Fly Ash	--	200	5,900	<1.0	11.5
QC-3 (SED-2)	8/3/2016	0-1	Fly Ash	--	240	5,900 J	<1.0	6.1
SED-3	7/20/2016	0-4.5	Slag	--	130	2,200	<1.0	5
	7/20/2016	4.5-5.5	SP	--	<50	<500	<0.20	<2.0
SED-4	7/19/2016	0-4.8	ML	--	510	4,100	<10.0	11.9 J
	7/19/2016	4.8-5.5		--	74 J	NA	NA	NA
GP-19	8/4/2016	8-12	SM	--	62 J	<500	<1.0	2 J
SLAG POND								
SED-5	7/20/2016	0-1.6	ML-OL	--	54 J	18,200	<1.0	33.3
SED-6	7/20/2016	0-1.0	ML	--	60 J	17,500	0.36 J	59.1
SED-7	8/4/2016	0-3.0	Fly Ash	--	88 J	11,300	<1.0	10.5
SED-8	8/4/2016	1.0-1.5	Fly Ash	--	82 J	11,400	<1.0	12.1
COAL YARD								
TP-CY-1	7/19/2016	0-0.5	Coal	--	140	<500	<2.0	<20.0
	7/19/2016	3.0-3.5	SM	--	100 J	<500	<1.0	<2.0
TP-CY-3	7/20/2016	1.9-2.1	GM	--	<50	7,600	<0.20	2.8 J
	7/20/2016	4.8-5.5	SM	--	NA	NA	NA	NA
TP-CY-4	7/19/2016	0-2.8	Coal	--	190	<500	<2.0	<20.0
	7/19/2016	2.8-3.2	GP & SM	--	<50	4,500	<1.0	<10.0
	7/19/2016	3.6-4.8	Slag	--	<50	<500	<2.0	<20.0
	7/19/2016	4.8-5.0		--	NA	NA	NA	NA
TP-CY-6	7/19/2016	0-0.5	Coal	--	190	<500	<2.0	<20.0
	7/19/2016	0.7-1.0	SP	--	<50	2,600	<0.20	2.3 J
TP-CY-10	7/19/2016	0-0.5	Coal	--	120	<25	<1.0	11.6
	7/19/2016	1.0-2.0	SM	--	<50	2,000	<1.0	2.3 J
	7/19/2016	6.5-7.0	SP	--	NA	NA	NA	NA
TP-CY-12	7/20/2016	0-0.3	Coal	--	160	<500	<2.0	<20.0
	7/20/2016	0.3-2.0	SP	--	<50	2,600	<0.20	2.2 J
	7/20/2016	2.0-2.7	SP	--	<50	700 J	<0.20	27.5
QC-1 (TP-CY-12)	7/20/2016	0.3-2.0	SP	--	<50	11,000	<0.20	2.5 J
SLAG HANDLING AREA								
GP-5	8/3/2016	12.5-15	Fly Ash	--	100	3,000	<1.0	3.0 J
	8/3/2016	18-24	ML & SM	--	99 J	2,300	<1.0	<2.0
GP-7	8/3/2016	7.5-18	Slag	--	<50	720 J	<1.0	<2.0
QC-2 (GP-7)	8/3/2016	7.5-18	Slag	--	<50	710 J	<1.0	<2.0
GP-14	8/4/2016	12.5-15	Fly Ash	--	120	25,200	<1.0	13.4

Sediment and Soil Analytical Results - Water Leach Test Results
WPL Nelson Dewey

Sample	Date	Depth (feet)	Material Type	Lab Notes	Boron (ug/L)	Calcium (ug/L)	Fluoride (mg/L)	Sulfate (mg/L)
SLAG SAMPLES[1]								
Slag 01 [2]	6/3/2013	--	Slag	--	NA	NA	NA	NA
Slag 01	12/23/2013	--	Slag	--	12.5 A B	1,240	NA	0.218
NED Slag Composite 2014	7/1/2014	--	Slag	--	11.7 AB*^	879 A	NA	0.457 B
Slag Sample	4/14/2015	--	Slag	--	< 1020 A	1,140 A	NA	0.427
FLY ASH SAMPLES[1]								
NED Flyash Composite [2]	2/14/2014	--	Fly Ash	--	NA	NA	NA	6,530 B
Week of 062815 [2]	7/3/2015	--	Fly Ash	--	NA	NA	NA	6,260
Week of 010916	1/4/2016	--	Fly Ash	--	NA	NA	NA	NA
NR 140 Preventive Action Limits (PALs)					200	NE	0.8	125
NR 140 Enforcement Standards (ESs)					1,000	NE	4	250
40 CFR Part 141.62 Maximum Contaminant Levels (MCL)					NE	NE	4	NE
NR 538 Table 1A Standards					190	NE	0.8	125
NR 538 Table 2A Standards					1,900	NE	8	1,250

Abbreviations:
ug/L = micrograms per liter
mg/L = milligrams per liter
NE = No Standard Established
ML-CL = Silty Clay
SM = Silty Sand
ML = Silt

Notes:
1. Slag and Fly Ash samples were collected by the plant as part of permit requirements.
2. Sample was analyzed using the SPLP Leach Method rather than the ASTM Water Leach Method for tested parameters except for Sulfate.
NR 140 ESs - Wisconsin Administrative Code (WAC), Chapter NR 140.10 Table 1 - Public Health Groundwater Quality Standards from July 2015 and WAC, Chapter NR 140.12 Table 2 - Public Welfare Groundwater Quality Standards from July 2015.
NR 140 PALs - WAC, Chapter NR 140.10 Table 1 - Public Health Groundwater Quality Standards from July 2015 and WAC, Chapter NR 140.12 Table 2 - Public Welfare Groundwater Quality Standards from July 2015.

Laboratory Notes/Qualifiers:
J = Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
A = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B = Compound was found in the blank and sample.
F1 = MS and/or MSD Recovery is outside acceptance limits.
H = Sample was prepped or analyzed beyond the specified holding time.
^ = ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
* = LCS or LCSD is outside acceptance limits.

Created by: RJG Date: 3/14/2016
Last revision by: RJG Date: 10/24/2016
Checked by: BSS Date: 10/24/2016
Original table prepared for Slag Pond Closure Low Hazard Waste Exemption Request (SCS Project #25216054.00).
Reformatted for the Alternative Source Demonstration to include only the parameters with SSIs that were included in the leach testing by SCC, 4/13/18.

I:\25216071.00\Reports\2018 ASD Report\Appendix G - 2017 leachate results slag and ash\[Table 4. Sediment_Soil_Water Leach Results_SSIParameters.xlsx]Leach Test - SSI Parameters

B2 Alternative Source Demonstration, April 2019 Detection Monitoring

Alternative Source Demonstration
April 2019 Detection Monitoring

Slag Pond
Nelson Dewey Generating Station
Cassville, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25219071.00 | October 14, 2019

2830 Dairy Drive
Madison, WI 53718-6751
608-224-2830

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Figures

Appendices

I:\25219071.00\Deliverables\2019 April ASD NED\191014_NED_April ASD.docx

PE CERTIFICATION

I, Sherren Clark, hereby certify that that the information in this alternate source demonstration is accurate and meets the requirements of 40 CFR 257.94(e)(2). This certification is based on my review of the groundwater data and related site information available for the Nelson Dewey Generating Station Slag Pond facility. I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.

10-11-19

(signature) (date)

Sherren Clark

(printed or typed name)

License number E-29863

My license renewal date is July 31, 2020.

Pages or sheets covered by this seal:

Alternative Source Demonstration, April 2019

Detection Monitoring – Slag Pond

Nelson Dewey Generating Station, Cassville

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1.0 INTRODUCTION

This Alternative Source Demonstration (ASD) was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" published by the U.S. Environmental Protection Agency (USEPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (USEPA, 2015), and subsequent amendments. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.94(e)(2). The applicable sections of the Rule are provided below in *italics*.

1.1 §257.94(E)(2) ALTERNATIVE SOURCE DEMONSTRATION REQUIREMENTS

The owner and operator may demonstrate that a source other than the CCR Unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels.

An ASD is completed when there are exceedances of one or more benchmarks established within the groundwater monitoring program. The ASD is completed to determine if any other sources are likely causes of the identified exceedance(s) of established benchmark(s) at the site. This ASD was performed in response to results indicating a statistically significant increase (SSI) over background levels during detection monitoring under the CCR Rule.

This ASD report is evaluating the SSIs observed in the statistical evaluation of the April 2019 detection monitoring event at the Nelson Dewey Generating Station (NED). The first ASD was prepared for this facility evaluating the SSIs observed in the statistical evaluation of the October 2017 detection monitoring event (SCS Engineers [SCS], 2018). The October 2017 ASD and subsequent semiannual updates have concluded that several lines of evidence demonstrates that SSIs reported for boron, fluoride, field pH, sulfate, and total dissolved solids (TDS) concentrations in the downgradient monitoring wells were likely due to man-made sources and/or naturally occurring constituents in the alluvial aquifer.

As discussed in more detail in **Section 4.2** of this ASD, the findings for the April 2019 monitoring event were generally consistent with those for the previous event. An SSI for chloride was newly identified at NED in the April 2019 sampling data evaluation and is further discussed later in this report.

1.2 SITE INFORMATION AND MAP

The NED site is located along the east bank of the Mississippi River, north of the Village of Cassville, in Grant County, Wisconsin (**Figure 1**). The facility includes a decommissioned coal fired generating plant, a CCR landfill that was closed in 2001, a closed Slag Pond, and a closed wastewater treatment pond. The layout of the site on an aerial photograph base is shown on **Figure 2**. The closed landfill at NED facility was permitted under Wisconsin Department of Natural Resources (WDNR) License #02525.

The existing CCR unit evaluated for this ASD is:

- Slag Pond (former existing CCR surface impoundment)

A map showing the CCR unit and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR groundwater monitoring program and the state monitoring program is provided as **Figure 3**.

Operations at the facility began in the late 1950s, and a CCR impoundment that included what is now the Slag Pond closure area was commissioned at that time. The CCR landfill was initially licensed in 1976 and received fly ash from NED until it was closed in phases between 1996 and 2001. The CCR landfill was initially operated as a fly ash sluice basin, then transitioned to dry ash placement prior to closure. The wastewater ponds, now closed, were constructed in 1976 for the purpose of settling CCR from the NED process wastewater streams and sediment from storm water runoff prior to discharge. Both NED generating units were retired on December 31, 2015, and have since been decommissioned. The generating station was demolished in 2017.

1.3 STATISTICALLY SIGNIFICANT INCREASES IDENTIFIED

SSIs were identified for boron, chloride, fluoride, field pH, sulfate, and TDS at one or more wells in the April 2019 monitoring event. A summary of the April 2019 constituent concentrations and the established benchmark concentrations is provided in **Table 1**. The October 2018 and November 2018 resampling results are also included for comparison. The constituent concentrations with SSIs above the background concentrations are highlighted in the table.

The SSIs for the April 2019 event were generally consistent with the October 2017, April 2018, and October 2018 SSIs, with the following changes. New SSIs were identified for chloride at B-11A and for pH at B-11B. There were no SSIs for calcium.

1.4 OVERVIEW OF ALTERNATIVE SOURCE DEMONSTRATION APPROACH

This ASD report includes:

- Background information (**Section 2.0**)
- Evaluation of potential that SSIs are due to methodology or analysis (**Section 3.0**)
- Evaluation of potential that SSIs are due to natural sources or man-made sources other than the CCR Units (**Section 4.0**)
- ASD conclusions (**Section 5.0**)
- Monitoring recommendations (**Section 6.0**)

The CCR Rule constituent results from background and compliance sampling for the parameters with SSIs are provided in **Table 2**. The laboratory report for the April 2019 event will be included in the 2019 Annual Groundwater Monitoring and Corrective Action report due in January 2020. Complete laboratory reports for the background monitoring events and previous detection monitoring events were included in the previous annual groundwater monitoring and corrective action reports.

2.0 BACKGROUND

To provide context for the ASD evaluation, the following background information is provided in this section of the report, prior to the ASD evaluation sections:

- Geologic and hydrogeologic setting
- CCR Rule monitoring system
- Other monitoring wells

A more detailed discussion of the background information for the site is provided in the ASD for the October 2017 event (SCS, 2018).

2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

2.1.1 Regional Information

The uppermost geologic formation beneath the NED plant is the surficial alluvial aquifer. The alluvial aquifer consists of Mississippi River valley sand and gravel deposits, and is the uppermost aquifer as defined in section 257.53 of the CCR Rule. This deposit is prevalent along the edges of the entire Mississippi River valley in southwestern Wisconsin.

The alluvial aquifer is underlain by dolomitic bedrock of the Prairie du Chien Group. The dolomite bedrock is also an aquifer and is likely hydraulically connected to the alluvial aquifer above.

Regionally, groundwater flow is generally to the southwest and discharges to the Mississippi River.

Additional details on the regional geology were provided in the October 2017 ASD (SCS, 2018).

2.1.2 Site Information

The thickness of the alluvium in the immediate vicinity of the plant is over 125 feet, as evidenced by local water supply well logs (SCS, 2018). These logs are also evidence that the alluvial aquifer yields useable quantities of groundwater for supply wells in the area. Soil boring logs for monitoring wells installed at the site also generally indicate sand and gravel soils within the monitored depths.

The groundwater flow direction in the vicinity of the plant is generally southwest toward the Mississippi River. Historically, infiltration at the former Slag Pond, former fly ash basin, and the former Wisconsin Pollutant Discharge Elimination System (WPDES) ponds caused groundwater mounding to be present around these features; however, these ponds have now all been closed and are no longer sources of infiltration.

Site water level measurements generally indicate that groundwater flow is to the southwest, discharging to the Mississippi River. However, during periods of high river water levels, the flow temporarily reverses and the river discharges to the shallow sand and gravel aquifer. The groundwater flow direction during the April 2019 detection monitoring event was toward the Mississippi River with flow moving south to southwest (**Figure 4**). The groundwater elevations are provided in **Table 3**. At the time of the April 2019 detection monitoring event, the Mississippi River and certain areas of the site were flooded from earlier spring rain events.

2.2 CCR RULE MONITORING SYSTEM

The groundwater monitoring system established in accordance with the CCR Rule consists of one upgradient (background) monitoring well and six downgradient monitoring wells. The background well is B-26. The downgradient wells include B-7R, B-11A, B-11B, B-11R, B-31A, and B-31R. The CCR Rule wells are installed within the surficial alluvium aquifer. Well depths range from approximately 23 to 114 feet, measured from the top of the well casing.

2.3 OTHER MONITORING WELLS

There are 19 groundwater monitoring wells at the NED facility that are part of the monitoring system developed for the state monitoring program. All of the wells included in the CCR monitoring well network were already in use for the state monitoring program. The well locations are shown on Figure 3. These 19 monitoring wells and two private wells are used to monitor groundwater conditions at the site under WDNR License Number 2525, which includes the closed CCR landfill (former fly ash settling basin) and the closed Slag Pond. Monitoring wells for the state monitoring program are installed in the surficial sand and gravel aquifer which is the uppermost aquifer as defined under 40 CFR 257.53.

3.0 METHODOLOGY AND ANALYSIS REVIEW

To evaluate the potential that an SSI is due to a source other than the regulated CCR unit, SCS Engineers (SCS) used a two-step evaluation process. First, the sample collection, field and laboratory analysis, and statistical evaluation were reviewed to identify any potential error or analysis that led to an exceedance of the benchmark. Second, potential alternative sources, including natural variation and man-made sources other than the CCR unit, were evaluated. This section of the report provides the findings of the methodology and analysis review. Section 4.0 of the report addresses the potential alternative sources.

3.1 SAMPLING AND FIELD ANALYSIS REVIEW

Field notes and sampling results were reviewed to determine if any sampling error may have caused or contributed to the observed SSIs. Potential field sampling errors or issues could include mislabeling of samples, improper sample handling, missed holding times, cross contamination during sampling, or other field error. Field blank sample results were also reviewed for any indication of potential contamination from sampling equipment or containers. Based on the review of the field notes and results, SCS did not identify any indication that the SSIs were due to a sampling error.

SCS did not identify any issues with the field pH analysis based on review of the data and field notes. Because boron, chloride, fluoride, TDS, and sulfate are laboratory parameters, there is little potential for a field analysis error to contribute to an SSI.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory reports for the April 2019 detection monitoring events were reviewed to evaluate whether any laboratory analysis error or issue may have caused or contributed to the observed SSIs. The laboratory report review included reviewing the laboratory quality control flags and narrative, verifying that correct methods were used and desired detection limits were achieved, and checking the field and laboratory blank sample results. Laboratory reports for the background monitoring events were reviewed for the October 2017 ASD. Laboratory reports for subsequent detection monitoring events were reviewed as part of the ASD preparation for each event.

Based on the review of the laboratory reports, SCS did not identify any indication that any SSI was due to a laboratory analysis error. There were no laboratory quality control flags or issues identified in the laboratory reports that affect the usability of the data for detection monitoring.

Time series plots of the SSI constituent analytical data were also reviewed for any anomalous results that might indicate a possible sampling or laboratory error (e.g., dilution error or incorrect sample labeling). The time series plots are provided in Appendix A. The April 2019 results for the downgradient wells are generally consistent with the historical data. The increasing boron

concentrations at B-11B are consistent with an increase in boron concentrations observed at this well beginning in 2010 under the state monitoring program. The sulfate concentrations detected at B-31R in October and November 2018 are the highest detected at this well in several years, but remain below the highest concentrations observed prior to the CCR landfill closure. The sulfate concentration in the sample from B-31R in April 2019 was lower than the 2018 results. None of the trend plots appeared to indicate a sampling or laboratory error.

3.3 STATISTICAL EVALUATION REVIEW

The review of the statistical results and methods included a quality control check of the following:

- Input analytical data vs. laboratory analytical reports
- Statistical method and process for each SSI

Based on the review of the statistical evaluation, SCS did not identify any errors or issues in the statistical evaluation that caused or contributed to the determination of interwell SSIs for boron, chloride, fluoride, pH, sulfate, and TDS at the downgradient monitoring wells.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

In summary, there were no changes to the SSI determinations for the April 2019 detection monitoring events based on the methodology and analysis review, and no errors or issues causing or contributing to the reported SSIs were identified.

4.0 ALTERNATIVE SOURCES

This section of the report discusses the potential alternative sources for the SSI constituents at the downgradient wells, identifies the most likely alternative source(s), and presents the lines of evidence indicating that an alternative source is the most likely cause of the observed SSIs.

4.1 POTENTIAL CAUSES OF SSI

4.1.1 Natural Variation

The statistical analysis was completed using an interwell approach, comparing the April 2019 detection monitoring results to the upper prediction limits (UPLs) calculated based on sampling of the background well (B-26). If concentrations of a constituent that is naturally present in the aquifer vary spatially, then the potential exists that the downgradient concentrations may be higher than upgradient concentrations due to natural variation.

Although natural variation is present in the shallow aquifer, it does not appear likely that natural variation is the primary source causing the boron, sulfate, chloride, and TDS SSIs. These parameters were detected at higher concentrations than would likely be present naturally.

Based on fluoride data for wells in the Grant County, natural variation may also have caused or contributed to the SSI for fluoride at B-11B.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the boron, chloride, fluoride, pH, sulfate, and TDS SSIs could include the closed CCR landfill, the coal storage area, or other plant

operations. Based the groundwater flow directions and on previous investigations at the site, the closed landfill appears to be the most likely cause of the SSIs for the downgradient wells B-7R, B-11A, B-11B, B-11R, B-31A, and B-31R. For the chloride SSI at B-11A, another man-made source, such as road salt, appears to be the most likely cause of the SSI.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that natural variation may also have caused or contributed to the fluoride SSIs include:

1. Although fluoride was not detected in background well B-26, publicly available data from the WDNR's Groundwater Retrieval Network (GRN) database indicates it is commonly detected in Grant County.

The lines of evidence indicating that the SSIs for boron, fluoride, pH, sulfate, and TDS in one or more compliance wells relative to the background well are more likely due to the closed landfill and prior fly ash sluicing than to the Slag Pond include:

1. A previous Environmental Contamination Assessment completed for the ash disposal facility indicated that the fly ash sluicing and landfill were the primary source of the groundwater impacts in the area, based on multiple lines of evidence.

2. Sampling performed in preparation for the Slag Pond closure indicated that the slag and the Slag Pond sediment had little potential to cause the SSIs for boron, chloride, fluoride, and sulfate.

3. Past and current groundwater monitoring performed under the state monitoring program shows that groundwater quality has improved since the 1990s in response to termination of fly ash sluicing and closure, and capping of the ash landfill.

The lines of evidence indicating that the SSI for Chloride is not due to the closed Slag Pond include:

1. The recent increase in chloride at B-11A does not correlate with increases in CCR-related parameters such as boron and sulfate.

2. Chloride results for the slag pond sediment and soil leach test samples were much lower than chloride levels in groundwater.

3. Historical groundwater monitoring results do not indicate that either the ash sluice pond or the slag pond were significant sources of chloride.

The data supporting these lines of evidence are discussed below. Most of these lines of evidence and the supporting data were discussed in detail in the ASD for the October 2017 detection monitoring event (SCS, 2018), with the exception of the chloride and TDS SSI concentrations. For lines of evidence included in previous ASDs, the discussion focuses on any updated information collected since the previous ASD, with references to the previous ASD for additional details.

4.2.1 Grant County Fluoride Data

Natural variation may have caused or contributed to the SSI for fluoride at B-11B. Although fluoride was not detected in background well B-26, publicly available data from the WDNR's GRN database indicates it is commonly detected in Grant County. Out of a total of 426 fluoride analysis results in

the GRN database for water supply wells in Grant County, as of September 2019, 89 percent had fluoride detected. The average concentration of fluoride in Grant County well samples with fluoride detections was 0.38 milligrams per liter (mg/L). The fluoride concentration reported for B-11B for April 2019, 0.64 mg/L, is in the range of concentrations in the GRN database for Grant County. The Grant County fluoride data are included in **Appendix B**. As discussed below, there is also a potential that fluoride concentrations in B-11B are associated with impacts from the closed CCR landfill.

4.2.2 Previous CCR Pond and Landfill Study

A previous investigation titled *Environmental Contamination Assessment: Nelson Dewey Generating Station Ash Disposal Facility*, completed by RMT in 1994, found that groundwater impacts were associated with disposal of fly ash in the now-closed CCR landfill located immediately north of the Slag Pond (**Figure 3**). The purpose of the 1994 Environmental Contamination Assessment (ECA) was to investigate the impacts to groundwater at the NED landfill. The ECA was used to evaluate feasibility of possible remedial alternatives. The remedial alternative that was ultimately selected was to convert the plant to dry fly ash handling.

The primary lines of evidence from the 1994 report that support the current ASD for boron, fluoride, pH, sulfate, and TDS include:

- Water leaching tests for ash and slag indicated that boron and sulfate concentrations in the slag leachate were orders of magnitude lower than in the ash leachate (**Appendix C**, **Table 5**).

- Surface water samples from the then active ash sluice pond and the Slag Pond indicated that boron and sulfate concentrations in the Slag Pond were one or more orders of magnitude lower than in the ash sluice pond. The surface water pH measurement was also higher in the ash sluice pond. The surface water boron and sulfate concentrations in the Slag Pond were higher than leach test results, which was attributed to infiltration of ash sluice pond water through the berm between the ponds into the Slag Pond (**Appendix C**, **Table 6**).

- Groundwater sampling at monitoring wells B-38 and B-38A (now abandoned), which were installed through and screened below the ash disposal area (now closed landfill), indicated that groundwater affected by ash sluicing was characterized by high pH and elevated concentrations of boron, fluoride, sulfate, and TDS (**Appendix C**, **Table 8**).

The results of the 1994 ECA were reported to WDNR on November 1994. The ECA investigation was then used for a feasibility study to determine appropriate ash disposal operation on site. Following the ECA, the plant converted to a dry ash handling system. Dry ash was placed in the CCR landfill through the 1990s, and the landfill was capped and closed in phases in 1996 through 2001. After that time, fly ash was not disposed of at the facility.

4.2.3 Slag Pond Closure Sampling Results

Results of leaching test analysis performed for slag, ash, soil, and sediment were submitted as part of a Low Hazard Exemption Request to the WDNR in March 2017 (SCS, 2017). The Exemption Request was submitted as part of the Closure Plan for the site and requested WDNR approval to consolidate materials from decommissioning activities in the Slag Pond and Slag Handling Area, which would then be capped with a composite final cover system. The sediment and soil samples were collected to characterize the materials that would remain on site under the Closure Plan. Leaching tests were performed using ASTM water leach test methods. The leaching test analytical

results for parameters with SSIs that were included in the leaching test program (boron, chloride, fluoride, and sulfate) are summarized in **Appendix D**.

The sampling results in the Exemption Request indicated that the materials to be consolidated and capped were not likely to cause groundwater standard exceedances for boron, chloride, fluoride, or sulfate. The leach test results for slag, Slag Pond sediment, and soil in the Slag Handling Area were below the state groundwater standards for these four parameters. The results were also below the concentrations of boron, chloride, fluoride, and sulfate in the downgradient CCR wells with SSIs, and well below the historic results for former well B-38, which was located within the CCR landfill area, upgradient from the Slag Pond.

The Low Hazard Exemption was granted by the WDNR based on the sampling results and other information presented.

4.2.4 State Program Groundwater Monitoring Results

Past and current groundwater monitoring performed under the state monitoring program shows that groundwater quality has improved substantially since the 1990s in response to termination of fly ash sluicing, and closure and capping of the ash landfill (SCS, 2018). The long-term trends show that concentrations of boron and sulfate in groundwater have decreased since termination of fly ash sluicing and closure of the landfill, in some cases by an order of magnitude or more. The results suggest that current boron, fluoride, sulfate, and TDS concentrations are likely residual contamination from historic ash disposal in the CCR landfill area. Increasing boron and sulfate concentrations at B-11B appear to be attributable to the closed CCR landfill and to changes in groundwater flow at the site, related to a decrease in the volume of water discharged to the Slag Pond and subsequent closure of the Slag Pond.

4.2.5 Chloride Lines of Evidence

As listed above, three primary lines of evidence indicate the chloride SSI at well B-11A is not due to the closed Slag Pond. Unlike the reported SSIs for some other parameters, the increased chloride concentrations are not clearly attributable to historic ash disposal in the closed CCR landfill area. Elevated chloride concentrations are likely related another man-made source, such as road salt. Although the specific source is unknown, the evidence detailed below indicates that the closed Slag Pond is not the source.

Chloride versus CCR Indicator Concentrations

The recent increase in chloride at B-11A does not correlate with increases in CCR-related parameters such as boron and sulfate. Although chloride exceeds the interwell UPL, other CCR indicator parameters such as boron and sulfate were not detected at concentrations exceeding background water levels in the sample from B-11A. The time series plots show the boron and sulfate concentrations at B-11A remained stable while the chloride concentration at B-11A has increased gradually since November 2017 and more sharply since October 2018 (**Appendix A**). The absence of other CCR indicator parameters with increasing trends suggests that the chloride SSI is due to some other source.

Slag Pond Sediment vs Groundwater Concentrations

Chloride results for slag pond sediment and soil leach test samples were much lower than chloride levels in groundwater. As discussed in **Section 4.2.3**, sediment and soil samples were previously collected in March 2017 to characterize the materials that would remain on site under the Closure

Plan for Low Hazard Exemption Request to the WDNR (SCS, 2017). The water leach testing analytical results show that the chloride leach test concentrations are significantly lower than the groundwater chloride concentrations observed at B-11A. The leach test results for chloride ranged from below the detection limit up to 4 mg/L, while the chloride concentrations in groundwater samples from B-11A ranged from approximately 40 mg/L to 83.6 mg/L (**Table 2**) during background and compliance sampling for the CCR monitoring program.

Chloride groundwater concentrations at background monitoring well B-26 also exceed the water leach test sediment results from the slag pond, ranging from 33.2 mg/L to approximately 80 mg/L. The low chloride concentrations observed from the slag pond sediment leach testing suggest the higher groundwater chloride concentrations observed at B-11A are due to another source and not the slag pond.

Historical Groundwater Monitoring

Historical groundwater monitoring results do not indicate that either the ash sluice pond or the slag pond were significant sources of chloride. The previous investigation by RMT in 1994, referenced in **Section 4.2.2**, included an analysis of chloride with its evaluation of groundwater impacts associated with the fly ash disposal from the closed CCR landfill and Slag pond area.

The historical results from the 1994 report that support the current ASD for chloride include:

- Groundwater sampling at monitoring wells B-38 and B-38A (now abandoned), which were installed through and screened below the ash disposal area (now closed landfill), indicated that groundwater affected by ash sluicing was characterized by lower concentrations of chloride observed, ranging from 23 mg/L to 26 mg/L from the June and September 1993 sampling events (**Appendix C**, **Table 8**). Monitoring wells downgradient from the active slag pond had even lower chloride concentrations.

- The background monitoring well, B-26, showed generally higher chloride concentrations, ranging from 21 mg/L to 43 mg/L, which may be associated with road salt use on Highway V (**Appendix C**, **Table 8**).

- The highest chloride concentrations were detected in samples from well B-35, which is located off-site on the historic Stonefield Village property. Chloride concentrations at this well ranged from 80 mg/L to 110 mg/L in the 1993 sampling (**Appendix C**, **Table 8**).

Based on these results, the chloride concentrations observed at B-11A appear to be likely from another source and not from the former ash sluice pond, closed landfill, or the Slag Pond. The historically higher chloride concentrations at B-26 and B-35 suggest the chloride concentrations observed at B-11A may be due to other man-made sources, such as road salt, septic systems, or agriculture.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSIs reported for boron, chloride, fluoride, field pH, sulfate, and TDS concentrations in downgradient monitoring wells demonstrate that the SSIs are likely primarily due to sources other than the closed Slag Pond. Most of the SSIs appear to be due to historic ash disposal in the closed landfill, which is not subject to the requirements of 40 CFR 257.50-107. The landfill is regulated by the WDNR under the solid waste program (License 02525). The SSIs for fluoride and field pH at B-11A, B-11B, B-11R, and B-31A may also be at least partially due to natural variability.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

In accordance with section 257.94(e)(2) of the CCR Rule, the NED Slag Pond site may continue with detection monitoring based on this ASD. The ASD report will be included in the 2019 Annual Report due January 31, 2020.

7.0 REFERENCES

RMT, 1994, Environmental Contamination Assessment: Nelson Dewey Generating Station Ash Disposal Facility, November 1994.

SCS Engineers, 2017, Low Hazard Exemption Request, Nelson Dewey Generating Station, Cassville, WI, March 2017.

SCS Engineers, 2018, 2017 Alternative Source Demonstration, October 2017 Monitoring Event, Nelson Dewey Generating Station, April 2018.

U.S. Environmental Protection Agency (USEPA), 2015, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, April 2015.

Tables

Table 1. Detection Monitoring Results Summary - October 2018 through April 2019
Nelson Dewey Slag Pond - Cassville, Wisconsin

Parameter Name	Units	Interwell Upper Prediction Limit (UPL)	Background Well		Compliance Wells														
			B-26		B-7R		B-11A		B-11B			B-11R		B-31A		B-31R			
			10/9/2018	4/22/2019	10/9/2018	4/22/2019	10/9/2018	4/22/2019	10/9/2018	11/12/2018	4/22/2019	10/9/2018	4/22/2019	10/9/2018	4/22/2019	10/9/2018	11/12/2018	4/22/2019
Boron	ug/L	66.5	53.4	41.6	**73**	**93.5**	**94.2**	**93.9**	**3,620**	NA	**6,830**	**576**	**1,360**	**71.8**	**86.2**	**1430**	NA	**906**
Calcium	mg/L	155,155	78,700	75,300	38,500	59,400	48,600	60,400	66,300	NA	83,300	49,900	82,400	46,600	48,200	125,000	NA	105,000
Chloride	mg/L	65.4	33.2	40.8	1.9 J	10.9	57.8	**83.6**	21.9	NA	28.4	5.9	12.6	40.2	40.8	19.7	NA	17.8
Fluoride	mg/L	LOQ (varies by well)	<0.1	<0.10	<0.1	<0.5 D3	0.29 J	0.29 J	**0.61**	NA	**0.64**	0.15 J	0.2 J	0.17 J	0.22 J	<0.1	NA	0.16 J
Field pH	Std. Units	7.81	7.2	7.1	6.23	6.63	7.43	7.62	7.74	8.05	**7.91**	6.55	6.82	7.48	7.61	6.41	6.59	6.62
Sulfate	mg/L	44.8	25.1	26.7	3.2	<5.0 D3	6	1.9 J	**197**	NA	**303**	15.1	34.6	24.8	21.6	**186**	**162**	**121**
Total Dissolved Solids	mg/L	594	450	458	186	254	332	386	**602**	594	**742**	266	406	278	284	**668**	**596**	516

149 Statistically significant increase at compliance well

Notes:
1. UPL based on parametric prediction limit based on 1-of-2 resampling methodology for all parameters except fluoride.
2. Nonparametric UPL for fluoride is equal to laboratory limit of quantitation. Double quantification rule applies for SSI.
3. UPLs calculated from background well results for December 2015 through October 2017.
4. Optional verification resampling consistent with the selected statistical methods was not performed.

J = Estimated concentration at or above the LOD and below the LOQ.

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I:\25219071.00\Deliverables\2019 April ASD NED\Tables\[Tables-NED-1,2, and 3.xlsx]Table 1

Table 2. Analytical Results - Appendix III Constituents with SSIs
Nelson Dewey Generating Station - Cassville, Wisconsin / SCS Engineers Project #25219071.00

Well Group	Well	Collection Date	Boron (µg/L)	Chloride (mg/L)	Field pH (St. Units)	Fluoride (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
Background	B-26	12/9/2015	29.6	45.5	7.35	<0.2 U	37.1	424
		4/12/2016	33.7	51.3	7.43	<0.2 U	38	456
		7/19/2016	28.6	55.6	7.14	<0.2 U	36.2	504
		10/20/2016	33	52.8	7.19	0.13 J	35	466
		1/12/2017	35.2	54.5	7.57	<0.1 U	35	446
		4/17/2017	50.1	56.0	7.54	<0.1 U	32.4	468
		6/7/2017	45.8	59.6	7.22	<0.1 U	31	538
		8/2/2017	54.6	52.6	7.21	<0.1 U	28.5	496
		10/19/2017	47.4	79.3	7.5	<0.1 U	25.3	542
		4/2/2018	48.0	54.4	7.64	<0.1 U	19.1	464
		10/8/2018	53.4	33.2	7.2	<0.1 U	25.1	450
		4/22/2019	41.6	40.8	7.1	<0.1 U	26.7	458
Compliance	B-11A	12/9/2015	124	40.4	7.7	0.3 J	3.2 J	338
		4/13/2016	116	43.0	7.75	0.38 J	3.8 J	362
		7/19/2016	104	46.6	7.42	0.35 J	2.7 J	336
		10/19/2016	112	46.5	7.47	0.36	3 J	340
		1/12/2017	106	46.6	7.89	0.43	2.3 J	322
		4/17/2017	100	45.4	7.38	0.36	<1 U	326
		6/8/2017	102	46.9	7.78	0.37	1.4 J	338
		8/1/2017	105	46.7	7.67	0.37	2.4 J	326
		10/19/2017	116	49.9	7.96	0.32	5.1	322
		4/2/2018	91	54.7 J, M0	8.04	0.24 J, M0	12.3 M0	336
		10/9/2018	94.2	57.8	7.43	0.29 J	6	332
		4/22/2019	93.9	83.6	7.62	0.29 J	1.9 J	386
	B-11B	12/9/2015	1140	31.2	8.06	0.44	134	494
		4/13/2016	1360	32.7	8.14	0.49	148	512
		7/19/2016	1210	33.6	7.77	0.45	165	520
		10/20/2016	1460	34.3	7.91	0.53	178	496
		1/12/2017	1540	36.1	8.18	0.52	182	488
		4/17/2017	1760	36.3	7.83	0.58	181	502
		6/8/2017	1880	33.9	8.07	0.59	191	516
		8/1/2017	1800	35.9	7.77	0.6	179	498
		10/19/2017	1500	36.1	7.77	0.59	175	510
		4/2/2018	2020	31.3	8.42	0.65	200	550
		10/9/2018	3620	21.9	7.74	0.61	197	602
		11/12/2018	NA	NA	8.05	NA	NA	594
		4/22/2019	6,830	28.4	7.91	0.64	303	742

Table 2. Analytical Results - Appendix III Constituents with SSIs
Nelson Dewey Generating Station - Cassville, Wisconsin / SCS Engineers Project #25219071.00

Well Group	Well	Collection Date	Boron (µg/L)	Chloride (mg/L)	Field pH (St. Units)	Fluoride (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
Compliance	B-11R	12/9/2015	4170	39.2	7.07	<1 U	75.4	616
		4/13/2016	3410	7.0	6.78	<0.2 U	18.4	682
		7/19/2016	3530	38.9	6.69	0.22 J	115	698
		10/20/2016	4120	39.1	6.77	<0.5 U	118	660
		1/12/2017	3530	42.3	6.98	<0.5 U	108	616
		4/17/2017	3520	40.2	7.11	<0.5 U	108	620
		6/7/2017	3420	42.0	6.8	<0.5 U	98.2	630
		8/1/2017	2040	24.7	6.7	0.25 J	126	738
		10/19/2017	3120	38.8	7.22	<0.5 U, D3	97.7	586
		4/2/2018	3180	36.8	7.14	<0.5 U, D3, M0	88.1	638
		10/9/2018	576	5.9	6.55	0.15 J	15.1	266
		4/22/2019	1,360	12.6	6.82	0.20 J	34.6	406
	B-31A	12/9/2015	59	35.3	7.65	<0.2 U	26.2	274
		4/13/2016	79.2	35.8	7.63	0.22 J	22.6	302
		7/19/2016	67.2	36.4	7.25	<0.2 U	24.2	280
		10/20/2016	63.7	39.0	7.54	0.18 J	27.2	292
		1/12/2017	76.4	39.9	7.82	0.22 J	29.8	284
		4/17/2017	69.9	40.3	7.83	0.19 J	31	318
		6/8/2017	58.5	40.9	7.74	0.18 J	31.2	296
		8/1/2017	56.3	40.8	7.56	0.2 J	26.6	284
		10/19/2017	63.9	40.8	7.92	0.16 J	26.1	290
		4/2/2018	74.8	42.7	8.0	0.13 J	27.4	282
		10/9/2018	71.8	40.2	7.48	0.17 J	24.8	278
		4/22/2019	86.2	40.8	7.61	0.22 J	21.6	284
	B-31R	12/9/2015	851	29.9	6.79	<0.2 U	28.8	374
		4/13/2016	838	17.6	6.76	<0.2 U	34.1	404
		7/19/2016	641	30.3	6.44	<0.2 U	38.5	406
		10/20/2016	1020	16.4	6.53	0.17 J	49.7	452
		1/12/2017	749	26.0	6.8	0.26 J	34.9	380
		4/17/2017	929	20.4	6.8	0.12 J	43	416
		6/8/2017	895	20.7	6.67	0.13 J	41.1	426
		8/1/2017	1550	3.6	6.56	0.16 J	55.6	432
		10/19/2017	645	29	7.19	0.14 J	19.2	358
		4/2/2018	540	32.6	6.76	<0.1U	22	374
		10/9/2018	1430	19.7	6.41	<0.1 U	186.0	668
		11/12/2018	NA	NA	6.59	NA	162.0	596
		4/22/2019	906	17.8	6.62	0.16 J	121.0	516

Table 2. Analytical Results - Appendix III Constituents with SSIs
Nelson Dewey Generating Station - Cassville, Wisconsin / SCS Engineers Project #25219071.00

Well Group	Well	Collection Date	Boron (µg/L)	Chloride (mg/L)	Field pH (St. Units)	Fluoride (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
Compliance	B-7R	12/9/2015	110	45.2	6.74	<1 U	17 J	198
		4/13/2016	115	4.6	6.8	<0.2 U	2.5 J	218
		7/18/2016	164	7.1	6.29	<0.2 U	2.4 J	220
		10/19/2016	154	22.0	6.55	<0.5 U	<5 U	288
		1/12/2017	159	19.7	7.43	<0.5 U	<5 U	240
		4/17/2017	129	13.1	6.6	<0.5 U	<5 U	278
		6/7/2017	110	12.8	6.65	<0.5 U	<5 U	240
		8/1/2017	129	8.1	6.28	<0.1 U	3.7	220
		10/19/2017	159	12	6.88	<0.5 U, D3	<5 U, D3	242
		4/2/2018	121	10.1	6.57	<0.5 U, D3	<5 U, D3	220
		10/9/2018	73	1.9 J	6.23	<0.1 U	3.2	186
		4/22/2019	93.5	10.9	6.63	<0.5 U, D3	<0.5 U, D3	254

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
mg/L = milligrams per liter or parts per million (ppm)

Flags:
U = Not detected.
J = Estimated concentration at or above the LOD and below the LOQ.
D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

Created by:	NDK	Date:	3/8/2018
Last revision by:	NDK	Date:	8/19/2019
Checked by:	AJR	Date:	8/20/2019

I:\25219071.00\Deliverables\2019 April ASD NED\Tables\[Tables-NED-1,2, and 3.xlsx]2. Analytical Results

Table 3. Groundwater Elevations - State and CCR Monitoring Wells
Nelson Dewey Generating Station - Cassville, Wisconsin / SCS Engineers Project #25219071.00

	Ground Water Elevation in feet above mean sea level (amsl)																
Well Number	**B-7R**	**B-8R**	**B-11R**	**B-11A**	**B-11B**	**B-21R**	**B-26**	**B-26A**	**B-28**	**B-30R**	**B-30AR**	**B-31R**	**B-31A**	**B-35**	**B-35A**	**B-37**	**B-37A**
Top of Casing Elevation (feet amsl)	623.35	627.51	622.62	622.12	621.89	621.03	626.40	626.40	616.81	621.81	622.4	622.42	622.69	620.78	621.2	614.85	614.85
Screen Length (ft)	10	10	10	5	5	10	10	5	10	10	5	10	5	10	5	10	5
Total Depth (ft from top of casing)	23.05	27.25	24.15	52.00	113.90	20.50	31.67	45.78	16.70	22.20	46.90	22.82	35.52	16.60	47.00	19.95	48.20
Top of Well Screen Elevation (ft)	610.30	610.26	608.47	575.12	512.99	610.53	604.73	585.62	610.11	609.61	580.50	609.60	592.17	614.18	579.20	604.90	571.65
Measurement Date																	
December 8, 2015	606.69	NM	606.71	606.30	606.26	NM	606.80	NM	NM	NM	NM	607.40	606.39	NM	NM	NM	NM
April 12, 2016	609.32	609.36	609.32	608.71	608.68	NM	609.81	609.72	NM	NM	NM	609.34	609.01	609.73	609.65	608.79	608.79
July 18-19, 2016	606.54	NM	606.14	606.76	606.74	NM	606.09	NM	NM	NM	NM	606.55	606.73	NM	NM	NM	NM
October 19-20, 2016	608.59	608.46	608.35	608.21	608.19	608.37	608.84	608.76	608.63	608.45	608.46	608.51	608.20	608.78	608.74	608.20	608.18
January 11-12, 2017	608.02	NM	607.96	607.83	607.78	NM	608.56	NM	NM	NM	NM	607.90	607.84	NM	NM	NM	NM
April 17, 2017	609.08	608.82	608.34	609.05	608.99	NM	608.59	608.54	609.94	608.57	608.64	607.20	608.98	609.00	609.02	609.02	609.02
June 8, 2017	610.74	NM	610.42	609.81	610.08	NM	611.25	NM	NM	NM	NM	609.63	610.50	NM	NM	NM	NM
August 1-2, 2017	607.02	NM	606.73	605.57	605.50	NM	607.39	NM	NM	NM	NM	606.84	605.69	NM	NM	NM	NM
October 9-10, 2017	606.93	606.51	606.25	607.01	606.94	NM	606.22	606.13	606.33	606.44	606.45	606.68	606.93	606.65	606.71	NM	NM
October 20, 2017	609.60	NM	609.42	609.58	609.65	NM	608.84	NM	NM	NM	NM	609.47	609.43	NM	NM	609.40	609.40
April 2-3, 2018	604.82	606.61	606.27	606.63	606.55	606.52	606.49	606.37	NM	NM	NM	604.44	606.46	606.68	606.70	606.77	606.83
October 8-10, 2018	610.76	610.68	610.67	610.28	610.24	NM	610.34	610.28	610.83	610.09	610.05	610.39	610.27	610.72	610.54	NM	NM
November 12, 2018	NM	NM	NM	NM	609.14	NM	NM	NM	NM	NM	NM	609.11	NM	NM	NM	NM	NM
April 22-23, 2019	615.28	615.66	615.28	615.29	615.28	614.98	615.49	615.31	615.40	615.36	615.35	615.01	615.33	615.87	615.98	--	--
Bottom of Well Elevation (ft)	600.30	600.26	598.47	570.12	507.99	600.53	594.73	580.62	600.11	599.61	575.50	599.60	587.17	604.18	574.20	594.90	566.65

Notes:
NM = not measured

Created by:	NDK	Date:	3/9/2018
Last revision by:	NDK	Date:	8/19/2019
Checked by:	AJR	Date:	8/20/2019

I:\25219071.00\Deliverables\2019 April ASD NED\Tables\[Tables-NED-1,2, and 3.xlsx]3.GW Elevation

Figures

N

CASSVILLE AND TURKEY RIVER QUADRANGLES
WISCONSIN–IOWA
7.5 MINUTE SERIES (TOPOGRAPHIC)
1978/1980
SCALE: 1" = 2,000'

CLIENT	WISCONSIN POWER AND LIGHT CO. NELSON DEWEY GENERATING STATION 11999 COUNTY HIGHWAY VV CASSVILLE WI, 53806	SITE	WISCONSIN POWER AND LIGHT NELSON DEWEY GENERATING STATION CASSVILLE, WISCONSIN

SITE LOCATION MAP

PROJECT NO.	25216071.17	DRAWN BY:	KP/BJM
DRAWN:	12/18/13	CHECKED BY:	KAK
REVISED:	01/02/18	APPROVED BY:	TK

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

FIGURE 1

I:\2521□071.00\Drawings\Site Location.dwg, 1/23/201□ 12:15:55 PM

N

NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS AUGUST 24, 2015.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25216071.17	DRAWN BY:	BJM
DRAWN:	12/18/13	CHECKED BY:	KAK
REVISED:	01/03/18	APPROVED BY:	SCC 04/16/18

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

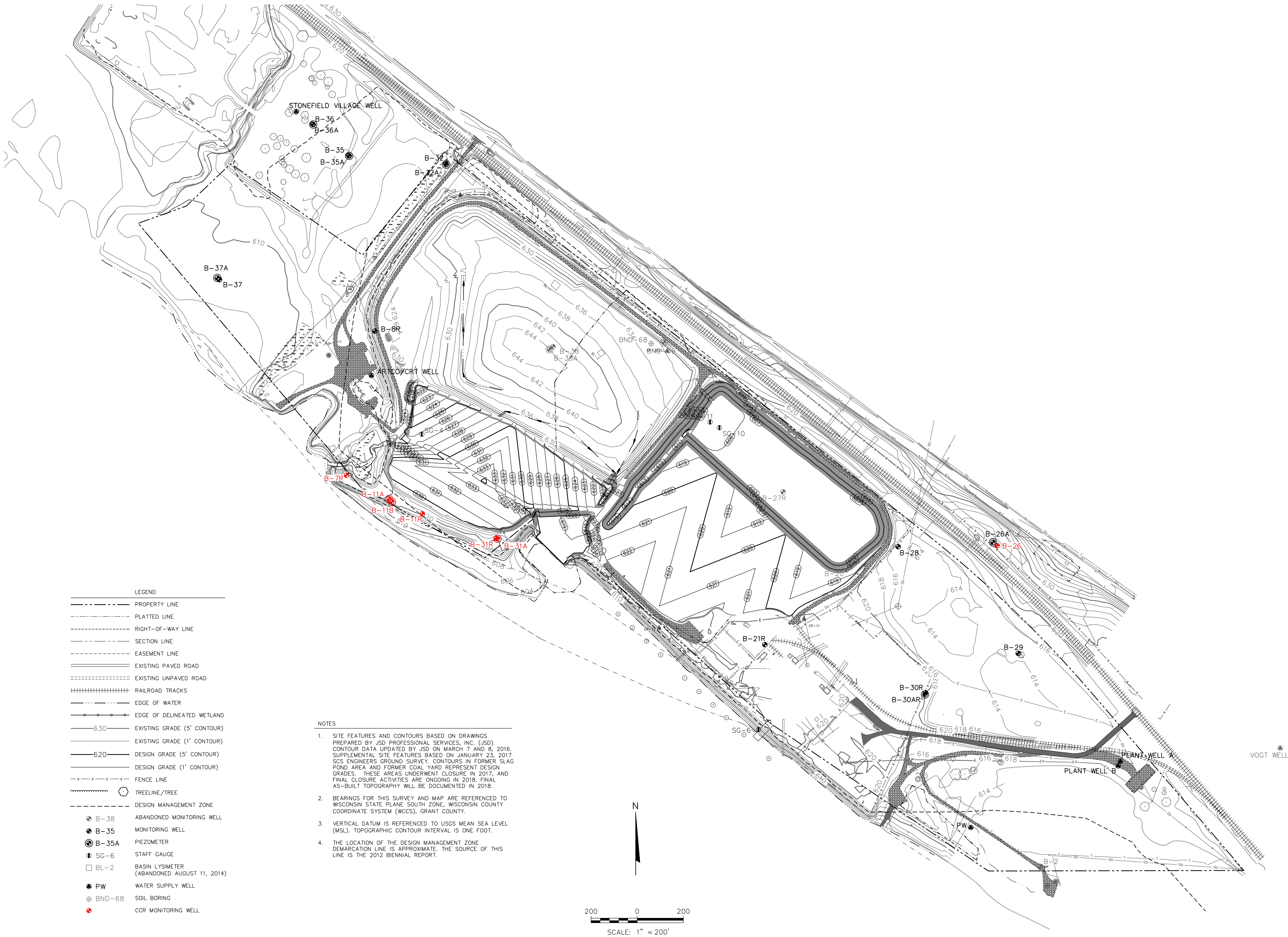
CLIENT: WISCONSIN POWER AND LIGHT CO.
NELSON DEWEY GENERATING STATION
11999 COUNTY HIGHWAY VV
CASSVILLE WI, 53806

SITE: WISCONSIN POWER AND LIGHT
NELSON DEWEY GENERATING STATION
CASSVILLE WISCONSIN

AERIAL VIEW

FIGURE 2

I:\2521□071.00\Drawings\□elson Dewe□Alternati□e Source De□onstration Report\Site Aerial.dwg, 4/1□/201□3:5□:2□PM



LEGEND

- PROPERTY LINE
- PLATTED LINE
- RIGHT-OF-WAY LINE
- SECTION LINE
- EASEMENT LINE
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- RAILROAD TRACKS
- EDGE OF WATER
- EDGE OF DELINEATED WETLAND
- 630 — EXISTING GRADE (5' CONTOUR)
- EXISTING GRADE (1' CONTOUR)
- 620 — DESIGN GRADE (5' CONTOUR)
- DESIGN GRADE (1' CONTOUR)
- FENCE LINE
- TREELINE/TREE
- DESIGN MANAGEMENT ZONE
- B-38 ABANDONED MONITORING WELL
- B-35 MONITORING WELL
- B-35A PIEZOMETER
- SG-6 STAFF GAUGE
- BL-2 BASIN LYSIMETER (ABANDONED AUGUST 11, 2014)
- PW WATER SUPPLY WELL
- BND-68 SOIL BORING
- CCR MONITORING WELL

NOTES

1. SITE FEATURES AND CONTOURS BASED ON DRAWINGS PREPARED BY JSD PROFESSIONAL SERVICES, INC. (JSD). CONTOUR DATA UPDATED BY JSD ON MARCH 7 AND 8, 2016. SUPPLEMENTAL SITE FEATURES BASED ON JANUARY 23, 2017 SCS ENGINEERS GROUND SURVEY. CONTOURS IN FORMER SLAG POND AREA AND FORMER COAL YARD REPRESENT DESIGN GRADES. THESE AREAS UNDERWENT CLOSURE IN 2017, AND FINAL CLOSURE ACTIVITIES ARE ONGOING IN 2018. FINAL AS-BUILT TOPOGRAPHY WILL BE DOCUMENTED IN 2018.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO WISCONSIN STATE PLANE SOUTH ZONE, WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), GRANT COUNTY.
3. VERTICAL DATUM IS REFERENCED TO USGS MEAN SEA LEVEL (MSL). TOPOGRAPHIC CONTOUR INTERVAL IS ONE FOOT.
4. THE LOCATION OF THE DESIGN MANAGEMENT ZONE DEMARCATION LINE IS APPROXIMATE. THE SOURCE OF THIS LINE IS THE 2012 BIENNIAL REPORT.

PROJECT NO.	25216071.17	DRAWN BY:	KP/BJM
DRAWN:	01/13/14	CHECKED BY:	NK
REVISED:	03/14/18	APPROVED BY:	SCC 4/16/18

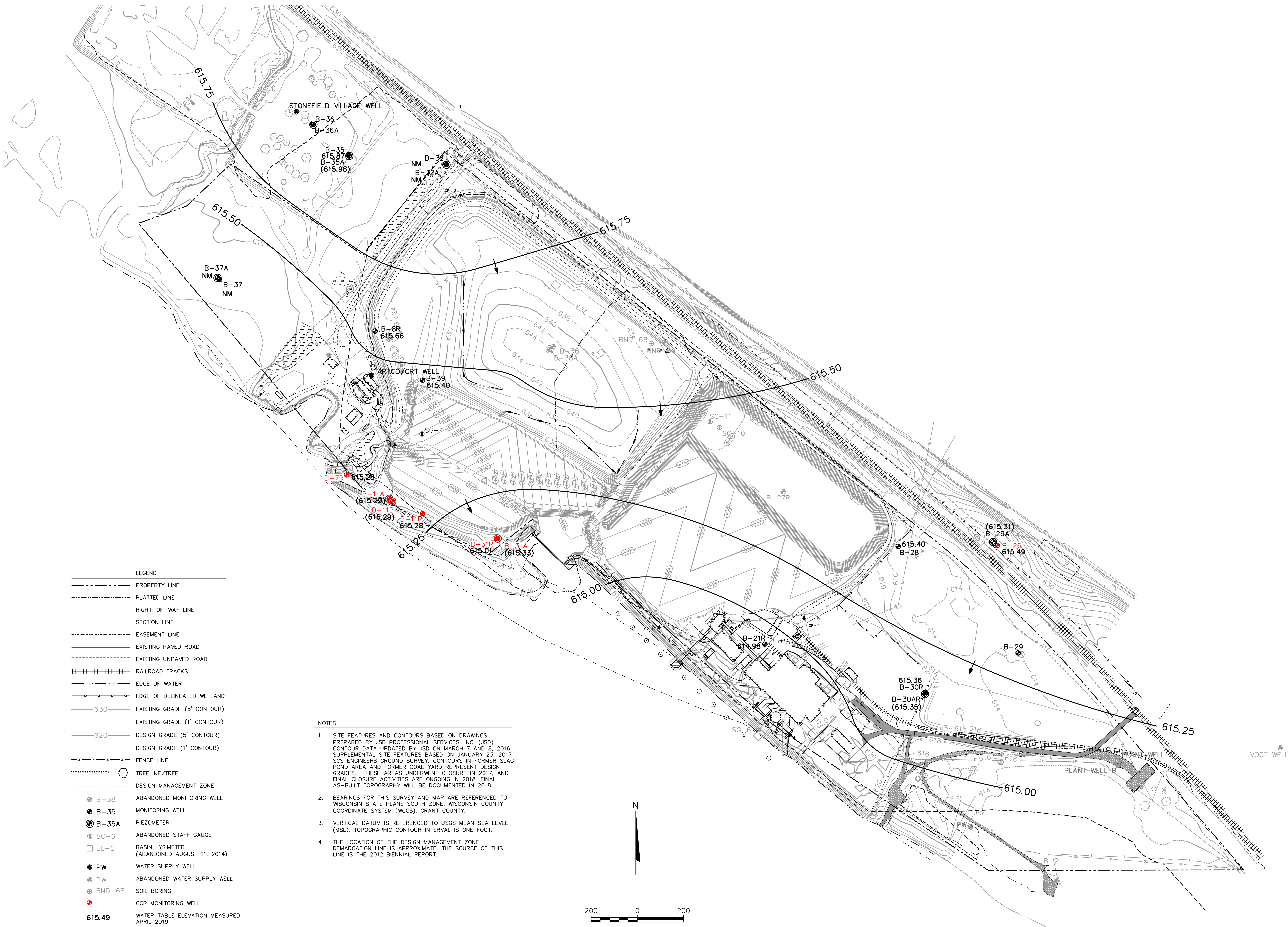
ENGINEER
SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT
WISCONSIN POWER AND LIGHT CO.
NELSON DEWEY GENERATING STATION
11999 COUNTY HIGHWAY VV
CASSVILLE, WI 53806

SITE
WISCONSIN POWER AND LIGHT
NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

MONITORING WELL LOCATION MAP

FIGURE 3



LEGEND

Symbol	Description
	PROPERTY LINE
	PLATTED LINE
	RIGHT-OF-WAY LINE
	SECTION LINE
	EASEMENT LINE
	EXISTING PAVED ROAD
	EXISTING UNPAVED ROAD
	RAILROAD TRACKS
	EDGE OF WATER
	EDGE OF DELINEATED WETLAND
630	EXISTING GRADE (5' CONTOUR)
	EXISTING GRADE (1' CONTOUR)
620	DESIGN GRADE (5' CONTOUR)
	DESIGN GRADE (1' CONTOUR)
	FENCE LINE
	TREELINE/TREE
	DESIGN MANAGEMENT ZONE
B-38	ABANDONED MONITORING WELL
B-35	MONITORING WELL
B-35A	PIEZOMETER
SG-6	ABANDONED STAFF GAUGE
BL-2	BASIN LYSIMETER (ABANDONED AUGUST 11, 2014)
PW	WATER SUPPLY WELL
PW	ABANDONED WATER SUPPLY WELL
BND-68	SOIL BORING
	CCR MONITORING WELL
615.49	WATER TABLE ELEVATION MEASURED APRIL 2019
(615.31)	WATER TABLE ELEVATION MEASURED APRIL 2019 (NOT USED FOR CONTOURING)
NM	NOT MEASURED
615.25	WATER TABLE CONTOUR (0.25' INTERVAL)
	APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES

1. SITE FEATURES AND CONTOURS BASED ON DRAWINGS PREPARED BY JSD PROFESSIONAL SERVICES, INC. (JSD). CONTOUR DATA UPDATED BY JSD ON MARCH 7 AND 8, 2016. SUPPLEMENTAL SITE FEATURES BASED ON JANUARY 23, 2017 SCS ENGINEERS GROUND SURVEY. CONTOURS IN FORMER SLAG POND AREA AND FORMER COAL YARD REPRESENT DESIGN GRADES. THESE AREAS UNDERWENT CLOSURE IN 2017, AND FINAL CLOSURE ACTIVITIES ARE ONGOING IN 2018. FINAL AS-BUILT TOPOGRAPHY WILL BE DOCUMENTED IN 2018.
2. BEARINGS FOR THIS SURVEY AND MAP ARE REFERENCED TO WISCONSIN STATE PLANE SOUTH ZONE, WISCONSIN COUNTY COORDINATE SYSTEM (WCCS), GRANT COUNTY.
3. VERTICAL DATUM IS REFERENCED TO USGS MEAN SEA LEVEL (MSL). TOPOGRAPHIC CONTOUR INTERVAL IS ONE FOOT.
4. THE LOCATION OF THE DESIGN MANAGEMENT ZONE DEMARCATION LINE IS APPROXIMATE. THE SOURCE OF THIS LINE IS THE 2012 BIENNIAL REPORT.

PROJECT NO.	25216071.18	DRAWN BY:	KP/BSS
DRAWN:	08/21/19	CHECKED BY:	NK
REVISED:	08/27/19	APPROVED BY:	TK 10/10/19

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: WISCONSIN POWER AND LIGHT CO.
NELSON DEWEY GENERATING STATION
11999 COUNTY HIGHWAY VV
CASSVILLE, WI 53806

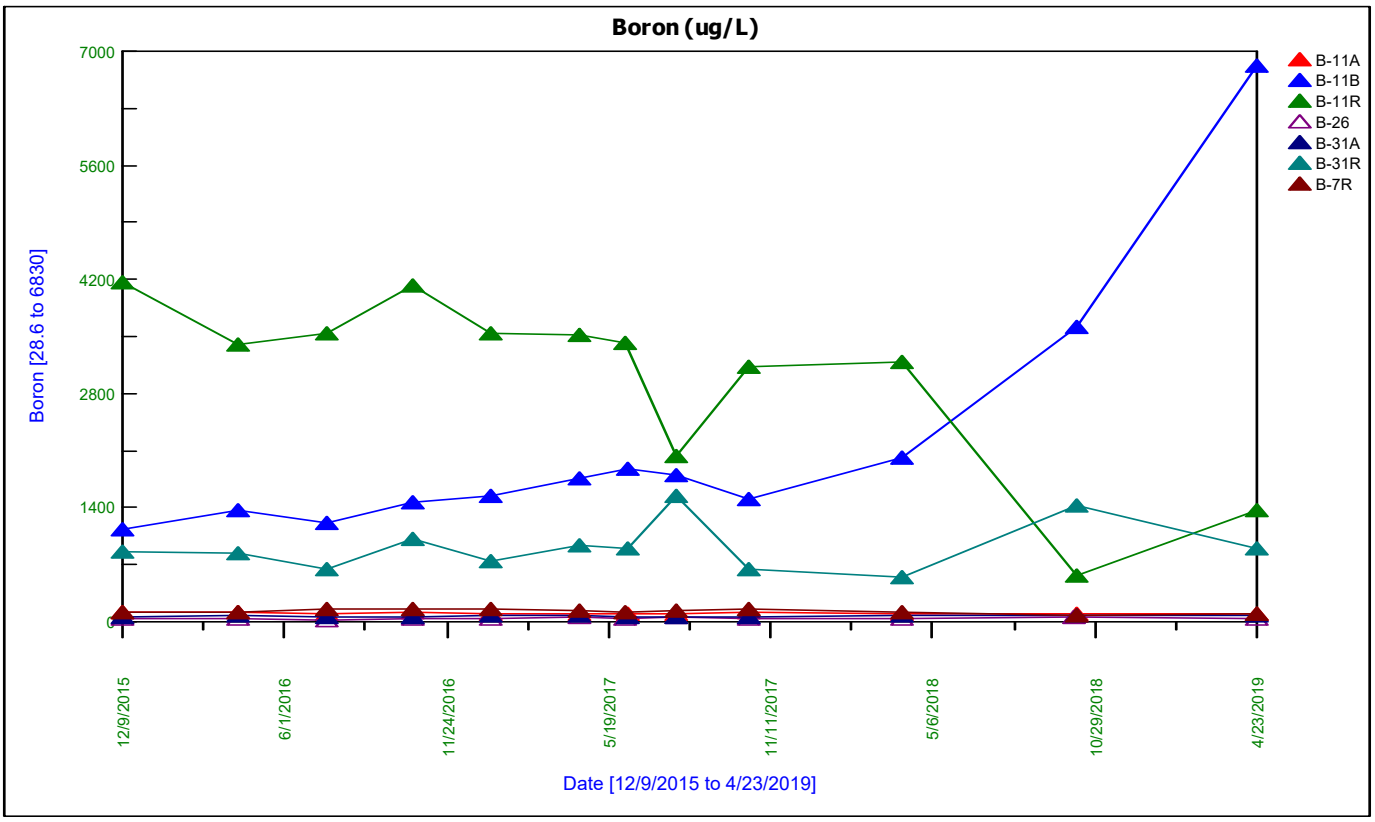
SITE: WISCONSIN POWER AND LIGHT
NELSON DEWEY GENERATING STATION
CASSVILLE, WISCONSIN

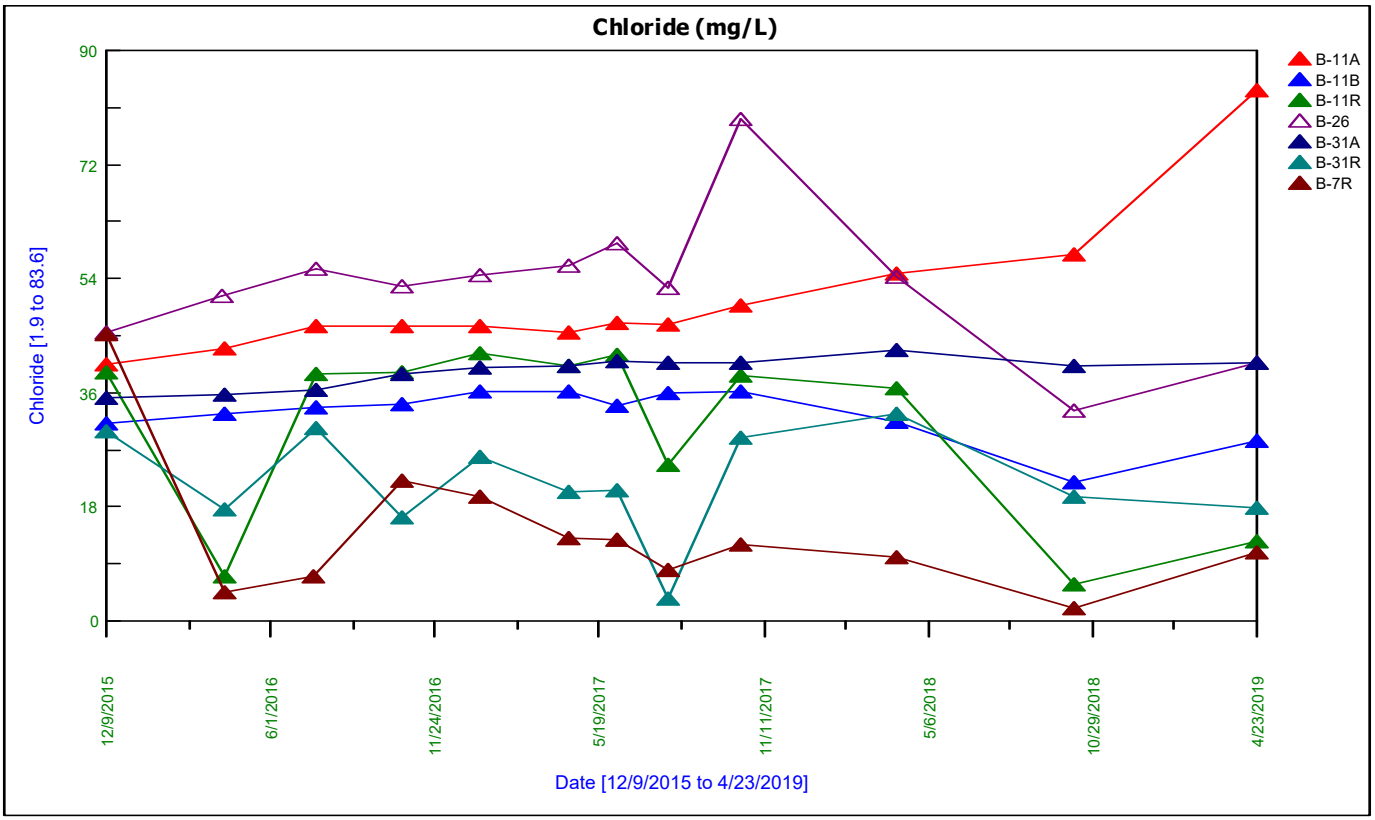
WATER TABLE FLOW MAP
APRIL 2019

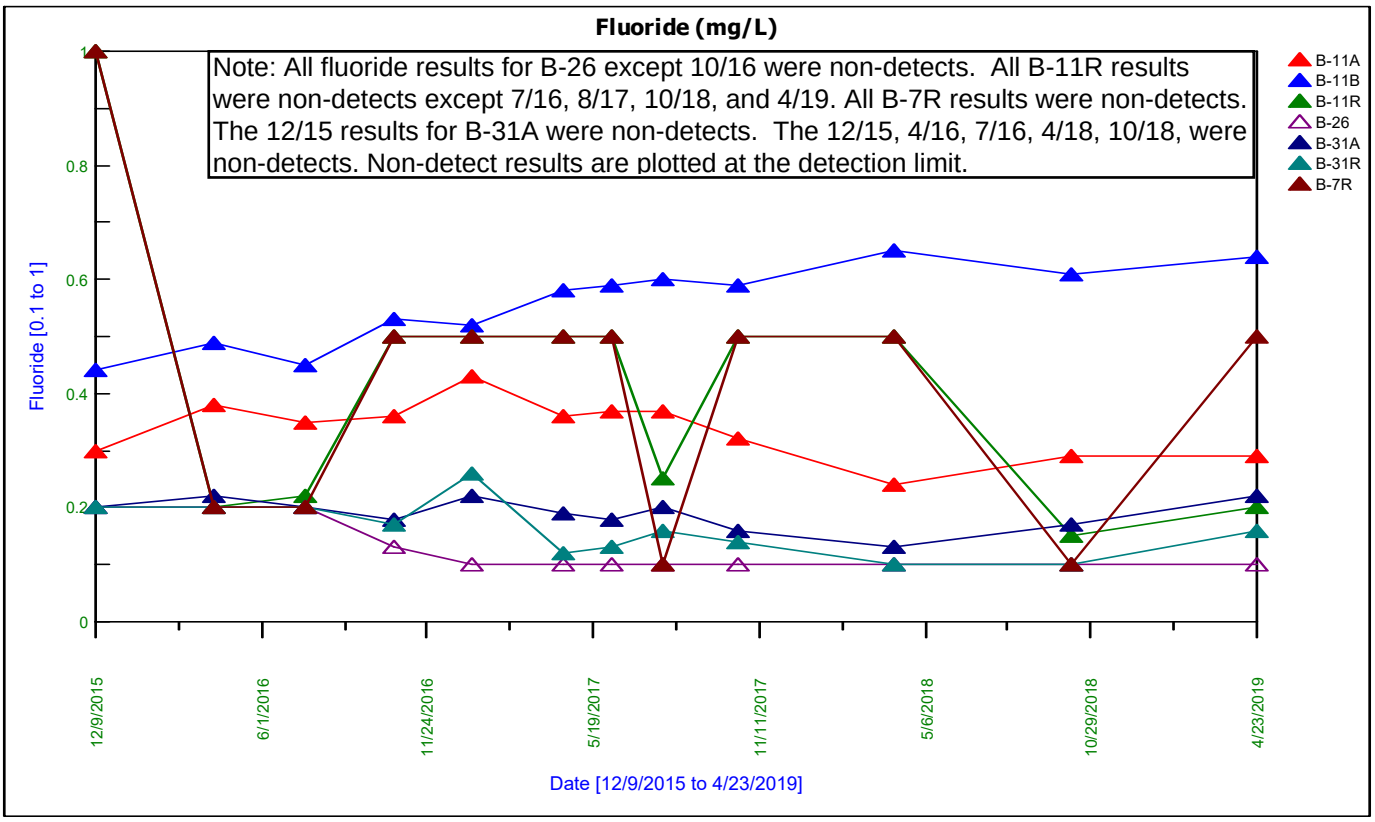
FIGURE 4

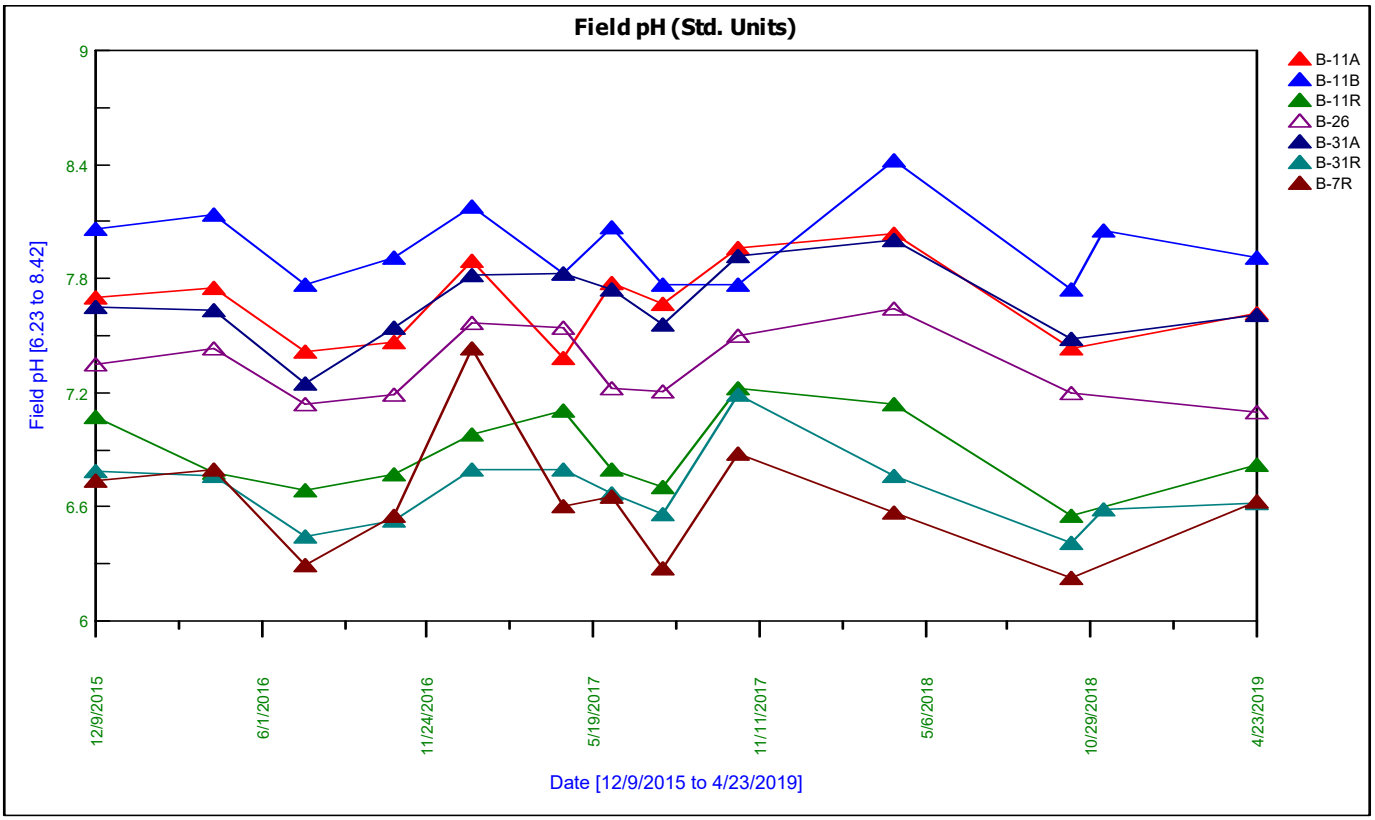
Appendix A

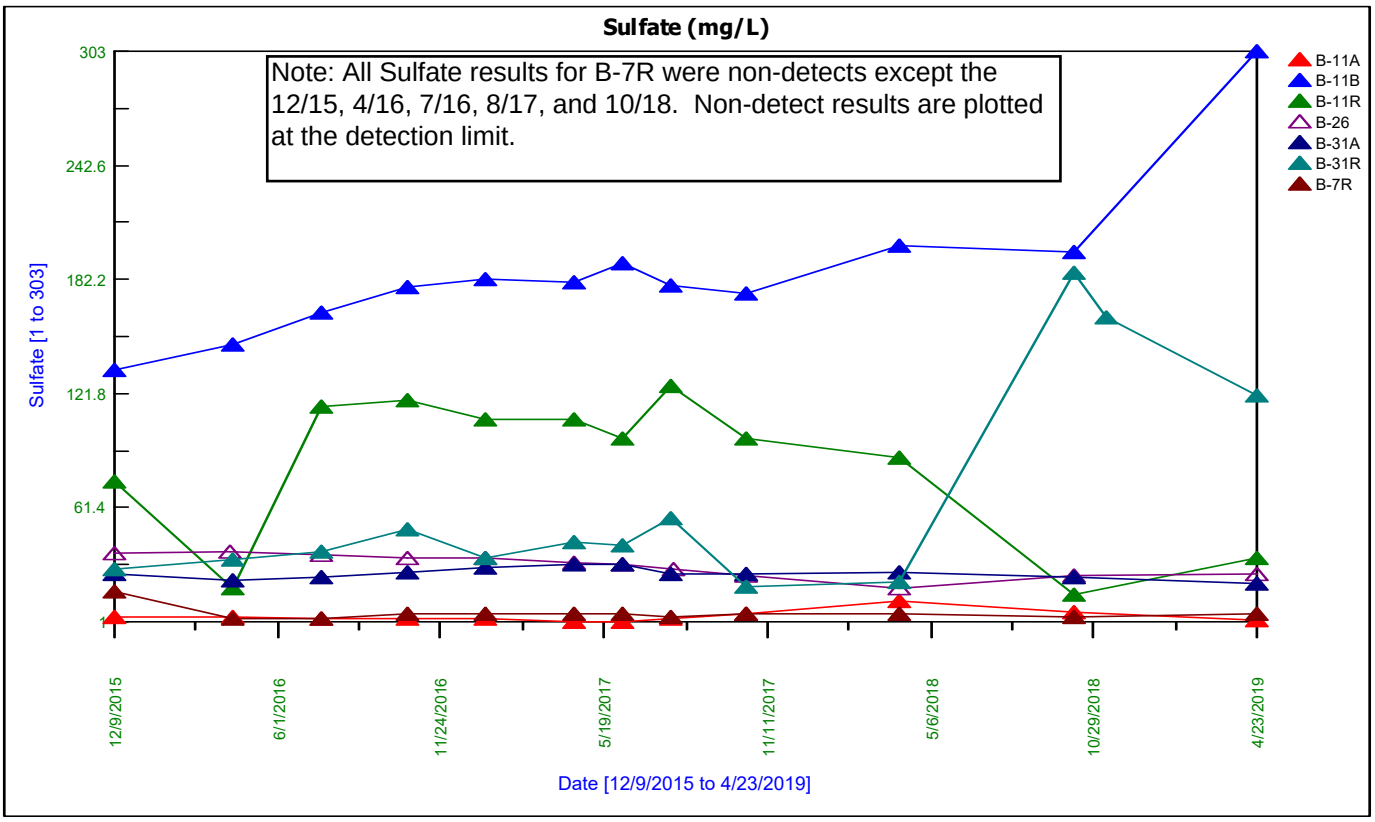
CCR Well Trend Plots

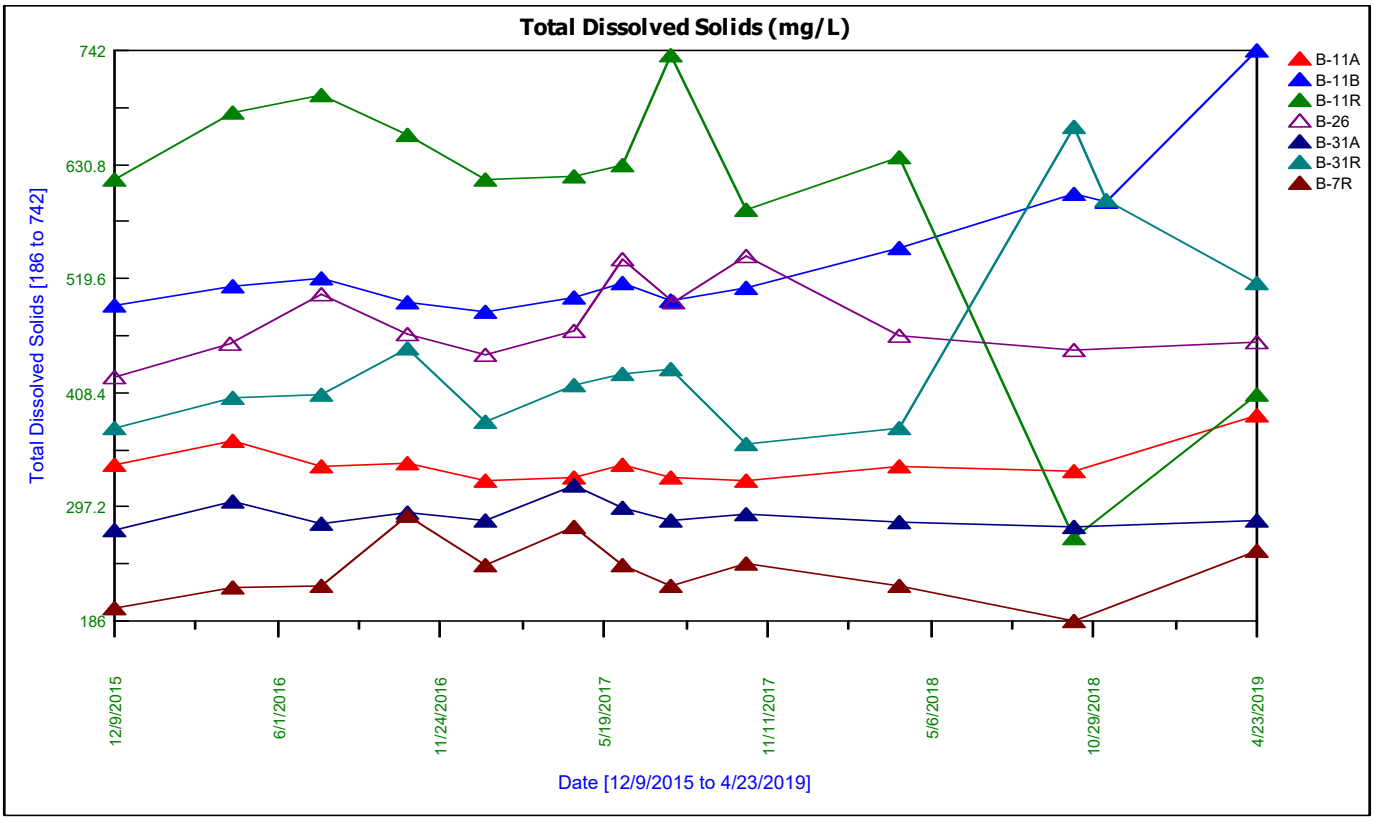

Boron (ug/L)
7000
5600
4200
2800
1400
Boron [28.6 to 6830]
B-11A
B-11B
B-11R
B-26
B-31A
B-31R
B-7R
12/9/2015
6/1/2016
11/24/2016
5/19/2017
11/11/2017
5/6/2018
10/29/2018
4/23/2019
Date [12/9/2015 to 4/23/2019]


Chloride (mg/L)
90
72
54
36
18
0
Chloride [1.9 to 83.6]
B-11A
B-11B
B-11R
B-26
B-31A
B-31R
B-7R
12/9/2015
6/1/2016
11/24/2016
5/19/2017
11/11/2017
5/6/2018
10/29/2018
4/23/2019
Date [12/9/2015 to 4/23/2019]


Fluoride (mg/L)
Note: All fluoride results for B-26 except 10/16 were non-detects. All B-11R results were non-detects except 7/16, 8/17, 10/18, and 4/19. All B-7R results were non-detects. The 12/15 results for B-31A were non-detects. The 12/15, 4/16, 7/16, 4/18, 10/18, were non-detects. Non-detect results are plotted at the detection limit.
B-11A
B-11B
B-11R
B-26
B-31A
B-31R
B-7R
Fluoride [0.1 to 1]
1
0.8
0.6
0.4
0.2
0
12/9/2015
6/1/2016
11/24/2016
5/19/2017
11/11/2017
5/6/2018
10/29/2018
4/23/2019
Date [12/9/2015 to 4/23/2019]


Field pH (Std. Units)
B-11A
B-11B
B-11R
B-26
B-31A
B-31R
B-7R
Field pH [6.23 to 8.42]
9
8.4
7.8
7.2
6.6
6
12/9/2015
6/1/2016
11/24/2016
5/19/2017
11/11/2017
5/6/2018
10/29/2018
4/23/2019
Date [12/9/2015 to 4/23/2019]


Sulfate (mg/L)
Note: All Sulfate results for B-7R were non-detects except the 12/15, 4/16, 7/16, 8/17, and 10/18. Non-detect results are plotted at the detection limit.
303
242.6
182.2
121.8
61.4
Sulfate [1 to 303]
B-11A
B-11B
B-11R
B-26
B-31A
B-31R
B-7R
12/9/2015
6/1/2016
11/24/2016
5/19/2017
11/11/2017
5/6/2018
10/29/2018
4/23/2019
Date [12/9/2015 to 4/23/2019]


Total Dissolved Solids (mg/L)
742
630.8
519.6
408.4
297.2
186
Total Dissolved Solids [186 to 742]
B-11A
B-11B
B-11R
B-26
B-31A
B-31R
B-7R
12/9/2015
6/1/2016
11/24/2016
5/19/2017
11/11/2017
5/6/2018
10/29/2018
4/23/2019
Date [12/9/2015 to 4/23/2019]

Appendix B

Grant County Fluoride Concentrations

Fluoride Data in WDNR's Groundwater Retrieval Network (GRN) Database for Water Supply Wells
Grant County, Wisconsin
Summary of Fluoride Detections

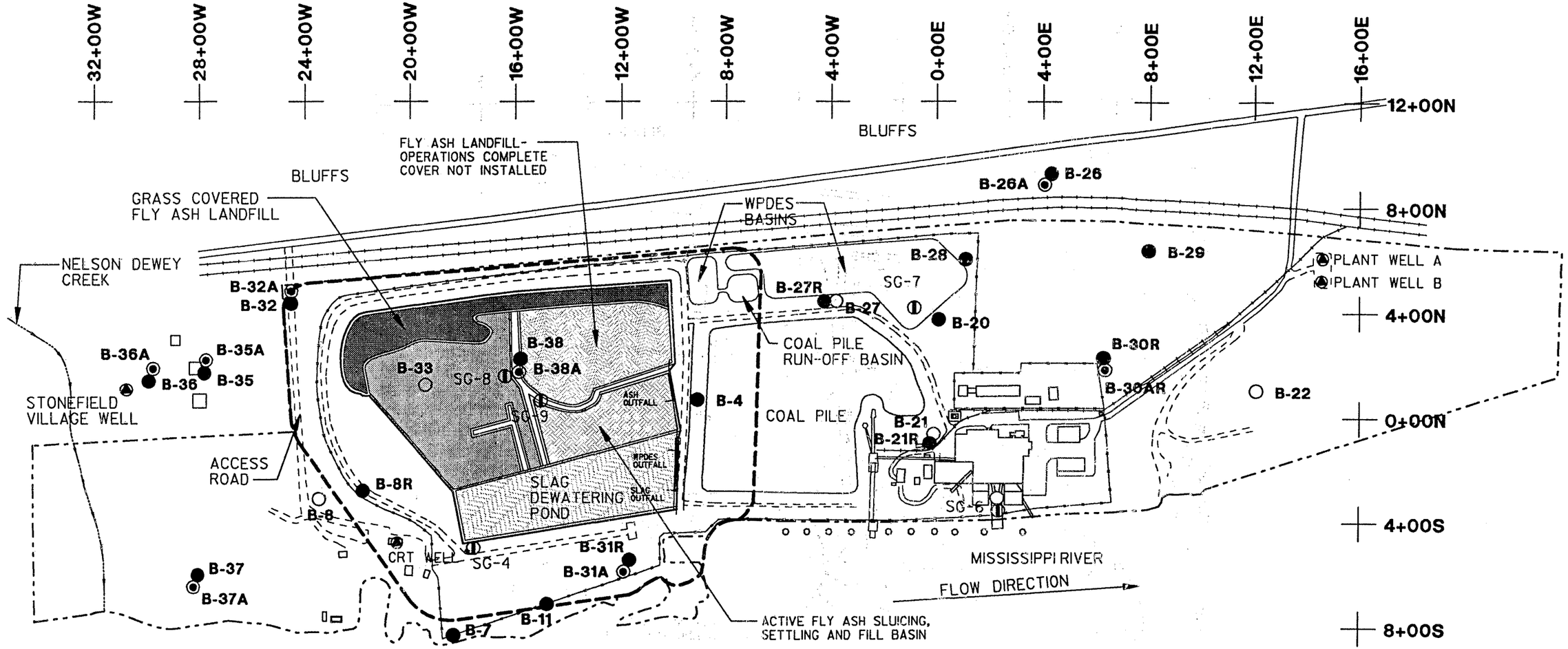
Row Labels	Count of Result amount
FLUORIDE TOTAL	**426**
DETECT BETWEEN LOD & LOQ	98
NON-DETECT	46
NORMAL QUANTIFIED RESULT	282
(blank)	
(blank)	
Grand Total	**426**

Percent With Fluoride Detected	**89%**

Data downloaded by SCS on 9/11/19

Appendix C

1994 RMT Environmental Contamination Assessment Information



LEGEND

● B-28	WATER TABLE OBSERVATION WELL
◉ B-28A	PIEZOMETER
○ B-33	ABANDONED WELL
▲ CRT WELL	WATER SUPPLY WELL
◐ SG-4	STAFF GAUGE
———	APPROXIMATE LIMITS OF LICENSED LANDFILL
——+——+——	RAILROAD TRACK
= = = = =	ROAD
— - — - —	PROPERTY LINE
— — — —	DESIGN MANAGEMENT ZONE
+ 0+00E	LOCAL GRID
□	BUILDINGS
o	PILINGS

NOTES

1. BASE MAP WELLHEAD LOCATIONS SURVEYED BY SCHMITT ENGINEERING IN OCTOBER 1993.
2. OTHER SITE INFORMATION PROVIDED BY WP&L.

TRUE

0 400 800

SCALE: 1"=400'

WISCONSIN POWER & LIGHT
NELSON DEWEY GENERATING STATION
EXISTING CONDITIONS
OCTOBER 1993

RMT, INC.

Dwn.By:	CDH
Approved By:	ELM
Date:	OCTOBER 1994
Proj.#:	2767.03
File #:	2767030LDGN

Plot File = P:\MSPC\2767030\DGN\2767030LDGN
Plot Date = Fri Oct 21 08:28:28 1994
Pen Table =DEFAULT.TBL

OCT 31 1994

FIGURE 4

TABLE 5

SUMMARY OF LEACHING TEST RESULTS

	Fly Ash		Slag
Year	1983	1990 to 1992	1987 to 1992
Coal Type	Eastern (and Western)	Western (and Eastern)	Western (and Eastern) [1]
Water:Solid Ratio	2:1	4:1	4:1
Extraction Time	24 hours	48 hours	48 hours
Number of Samples	1	3	6
Arsenic (mg/L)	< 0.001	0.05 to 2.02	< 0.002 to 0.081
Selenium (mg/L)	NA	0.42 to 160	< 0.002 to 0.045
Boron (mg/L)	420	4.63 to 37.34	< 0.010 to 1.05
Iron (mg/L)	NA	NA	< 0.02 to 0.98
Sulfate (mg/L)	13,070	2,000 to 16,700	2.0 to < 5.0
pH (SU)	6.6	10.3 to 12.5	5.6 to 9.9

NOTES:

1. 1983 fly ash leaching data from RMT (1984); remaining leaching data provided by WP&L.
2. NA = Not Analyzed.

PROJECT NUMBER: 1831.28
BEGINNING DATE: 01-JUN-93
ENDING DATE: 07-SEP-93

TABLE 6
SLAG AND ASH BASIN CHEMISTRY

PARAMETER	UNITS	FLY ASH BASIN 07-SEP-93 3302-011		SLAG BASIN 07-SEP-93 3302-010	
COLOR, FIELD		CLEAR		CLEAR	
CONDUCTANCE, SPECIFIC	UMHOS/CM	5190		400	
ODOR, FIELD		NONE		NONE	
PH, FIELD	SU	8.1		7.4	
TEMPERATURE	DEG C	17		18	
TURBIDITY, FIELD		SLIGHT		SLIGHT	
ALKALINITY AS CACO3	MG/L	230		160	
HARDNESS AS CACO3	MG/L	930		200	
SOLIDS, TOTAL DISSOLVED	MG/L	410		300	
SULFATE	MG/L	3300		50	
ARSENIC, TOTAL	UG/L	60		8.0	
BARIUM, TOTAL	UG/L	270		150	
BORON, TOTAL	UG/L	2300		210	
CADMIUM, TOTAL	UG/L	5.4		< 0.30	
CHROMIUM, TOTAL	UG/L	11		< 10	
IRON, TOTAL	UG/L	1600		2000	
LEAD, TOTAL	UG/L	< 3.0		< 3.0	
MERCURY, TOTAL	UG/L	< 0.20		< 0.20	
SELENIUM, TOTAL	UG/L	36	I	2.1	L
SILVER, TOTAL	UG/L	< 1.0		< 1.0	

wpvalid:SWI.BJC

18-OCT-94

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ENDING DATE: 29-OCT-93

TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-04 01-JUN-93 1670-015	B-04 07-SEP-93 3293-010	B-07 ND 01-JUN-93 1670-020	B-07 ND 07-SEP-93 3302-004	B-08 01-JUN-93 1670-001	B-08R 07-SEP-93 3293-009
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	1160	1240	460	550	670	1160
DEPTH TO WATER	FEET	9.90	12.75	12.83	16.12	5.68	20.13
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.3	7.5	7.0	6.9	7.1	6.8
TEMPERATURE	DEG C	15	10	14	12	15	7
TURBIDITY, FIELD		NONE	SLIGHT	NONE	SLIGHT	NONE	MODERATE
WATER ELEVATION	FEET	610.68	607.83	610.97	607.68	610.51	
ALKALINITY AS CACO3	MG/L	72	92	160	190	220	440
CHLORIDE	MG/L	18	23	17	15	9.4	2.8
COD	MG/L						
FLUORIDE	MG/L	0.58	5.5	0.26	0.32	< 0.10	0.12
HARDNESS AS CACO3	MG/L	220	120	210	250	370	620
NITROGEN, NITRATE + NITRITE	MG/L	0.15	0.33	< 0.050	< 0.050	< 0.050	4.2
SOLIDS, TOTAL DISSOLVED	MG/L	900	940	300	360	460	770
SULFATE	MG/L	500	560	74	100	180	180
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L	68	< 50	61	73	63	50
BORON, DISSOLVED	UG/L	1900	4200	230	< 200	2200	9400
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	0.38
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20
IRON, DISSOLVED	UG/L	720	890	2800	4100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	1200	720	970	1500	17	3400
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	6.9	3.2	< 1.0 L	< 1.0 L	< 1.0 L	34
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	1000	100	22	< 20	220	< 20

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-11 07-SEP-93 X0001	B-11 29-OCT-93 3485-001	B-20 07-SEP-93 X0002	B-26 01-JUN-93 1670-022	B-26 07-SEP-93 3302-005	B-26A 01-JUN-93 1670-023
COLOR, FIELD					CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	1500		310	610	670	660
DEPTH TO WATER	FEET	15.91		10.81	16.22	18.85	16.20
ODOR, FIELD					NONE	NONE	NONE
PH, FIELD	SU				7.1	7.2	7.0
TEMPERATURE	DEG C	13	13	14	14	11	15
TURBIDITY, FIELD					NONE	SLIGHT	NONE
WATER ELEVATION	FEET				610.18	607.55	610.19
ALKALINITY AS CACO3	MG/L		470		320	300	340
CHLORIDE	MG/L				21	43	33
COD	MG/L						
FLUORIDE	MG/L				< 0.10	0.15	< 0.10
HARDNESS AS CACO3	MG/L		810		390	410	400
NITROGEN, NITRATE + NITRITE	MG/L				2.6	4.9	2.0
SOLIDS, TOTAL DISSOLVED	MG/L		520		440	450	450
SULFATE	MG/L		360		34	34	33
ARSENIC, DISSOLVED	UG/L		8.4		< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L		100		62	68	96
BORON, DISSOLVED	UG/L		5100		< 200	< 200	< 200
CADMIUM, DISSOLVED	UG/L		< 0.30		< 0.30	< 0.30	< 0.30
CHROMIUM, DISSOLVED	UG/L		< 10		< 10	< 10	< 10
COPPER, DISSOLVED	UG/L				< 20	< 20	< 20
IRON, DISSOLVED	UG/L		55000		< 100	< 100	< 100
LEAD, DISSOLVED	UG/L		< 3.0		< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L				< 5.0	< 5.0	< 5.0
MERCURY, DISSOLVED	UG/L		< 0.20		< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L		< 1.0 LNP		< 1.0 L	< 1.0 L	< 1.0 L
SILVER, DISSOLVED	UG/L		< 10		< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L				< 20	< 20	< 20

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-26A 07-SEP-93 3302-006	B-27R 07-SEP-93 X0003	B-28 01-JUN-93 1670-014	B-28 07-SEP-93 3302-003	B-29 07-SEP-93 X0004	B-30AR 01-JUN-93 1670-013
COLOR, FIELD		CLEAR		CLEAR	CLEAR		CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	440	370	190	230	360	220
DEPTH TO WATER	FEET	18.84	14.67	6.40	9.08	9.57	12.33
ODOR, FIELD		NONE		NONE	NONE		NONE
PH, FIELD	SU	7.2		6.1	6.0		7.2
TEMPERATURE	DEG C	11	14	17	15	15	17
TURBIDITY, FIELD		NONE		SLIGHT	MODERATE		NONE
WATER ELEVATION	FEET	607.55		610.46	607.74	607.26	610.11
ALKALINITY AS CACO3	MG/L	340		26	54		200
CHLORIDE	MG/L	25		4.6	11		13
COD	MG/L						7.3
FLUORIDE	MG/L	0.15		< 0.10	< 0.10		0.10
HARDNESS AS CACO3	MG/L	410		82	110		220
NITROGEN, NITRATE + NITRITE	MG/L	1.8		2.7	0.60		< 0.050
SOLIDS, TOTAL DISSOLVED	MG/L	440		140	160		280
SULFATE	MG/L	38		45	42		27
ARSENIC, DISSOLVED	UG/L	< 3.0		< 3.0	< 3.0		< 3.0
BARIUM, DISSOLVED	UG/L	86		< 50	52		< 50
BORON, DISSOLVED	UG/L	< 200		< 200	< 200		< 200
CADMIUM, DISSOLVED	UG/L	< 0.30		< 0.30	< 0.30		< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10		< 10	< 10		< 10
COPPER, DISSOLVED	UG/L	< 20		< 20	< 20		< 20
IRON, DISSOLVED	UG/L	< 100		210	< 100		< 100
LEAD, DISSOLVED	UG/L	< 3.0		< 3.0	< 3.0		< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0		8.6	< 5.0		< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20		< 0.20	< 0.20		< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 LN		< 1.0 L	< 1.0 L		< 1.0 L
SILVER, DISSOLVED	UG/L	< 1.0		< 1.0	< 1.0		< 1.0
ZINC, DISSOLVED	UG/L	< 20		< 20	< 20		< 20

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PARAMETER	UNITS	B-30AR 07-SEP-93 3302-002	B-30R 01-JUN-93 1670-012	B-30R 07-SEP-93 3302-001	B-31A 01-JUN-93 1670-019	B-31A 07-SEP-93 3293-011	B-31R 01-JUN-93 1670-018
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	410	420	360	700	800	640
DEPTH TO WATER	FEET	15.37	12.25	15.17	12.21	15.93	11.56
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.3	7.0	6.8	6.9	7.3	6.8
TEMPERATURE	DEG C	12	16	14	17	14	17
TURBIDITY, FIELD		NONE	MODERATE	MODERATE	NONE	SLIGHT	SLIGHT
WATER ELEVATION	FEET	607.07	610.10	607.18	610.46	606.74	610.85
ALKALINITY AS CACO3	MG/L	190	160	140	170	160	240
CHLORIDE	MG/L	14	13	6.6	16	17	11
COD	MG/L		9.7				
FLUORIDE	MG/L	0.16	< 0.10	< 0.10	0.39	0.43	< 0.10
HARDNESS AS CACO3	MG/L	230	210	210	120	160	330
NITROGEN, NITRATE + NITRITE	MG/L	< 0.050	8.5	8.8	< 0.050	< 0.050	< 0.050
SOLIDS, TOTAL DISSOLVED	MG/L	280	280	230	510	570	510
SULFATE	MG/L	25	25	26	250	250	150
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L	< 50	< 50	< 50	54	66	110
BORON, DISSOLVED	UG/L	< 200	< 200	< 200	2900	2100	2900
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	2.7
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	110
IRON, DISSOLVED	UG/L	< 100	< 100	< 100	210	300	450
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0	< 5.0	< 5.0	4600	6000	440
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	1.3 L	3.2	< 1.0 L	< 1.0 L	1.2 L
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	27

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-31R 07-SEP-93 3293-012	B-32 01-JUN-93 1670-002	B-32 07-SEP-93 3293-016	B-32A 01-JUN-93 1670-003	B-32A 07-SEP-93 3293-017	B-35 01-JUN-93 1670-004
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	L YLW/BN
CONDUCTANCE, SPECIFIC	UMHOS/CM	480	300	330	610	1320	1070
DEPTH TO WATER	FEET	14.44	3.37	6.22	3.59	6.46	10.10
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.0	6.3	5.6	7.0	6.8	6.3
TEMPERATURE	DEG C	15	13	14	13	14	12
TURBIDITY, FIELD		MODERATE	SLIGHT	MODERATE	NONE	SLIGHT	SLIGHT
WATER ELEVATION	FEET	607.97	610.80	607.95	610.81	607.94	610.66
ALKALINITY AS CACO3	MG/L	190	140	140	330	320	190
CHLORIDE	MG/L	11	6.7	6.9	7.0	7.6	110
COD	MG/L						
FLUORIDE	MG/L	0.18	< 0.10	0.12	0.12	0.19	< 0.10
HARDNESS AS CACO3	MG/L	240	160	180	350	390	260
NITROGEN, NITRATE + NITRITE	MG/L	< 0.050	0.68	1.2	1.1	1.3	36
SOLIDS, TOTAL DISSOLVED	MG/L	340	200	240	380	420	800
SULFATE	MG/L	71	11	16	29	30	35
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	7.4
BARIUM, DISSOLVED	UG/L	81	100	120	98	91	100
BORON, DISSOLVED	UG/L	1100	< 200	< 200	< 200	< 200	210
CADMIUM, DISSOLVED	UG/L	1.1	< 0.30	0.38	< 0.30	0.35	< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	21
IRON, DISSOLVED	UG/L	210	< 100	< 100	< 100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	360	< 5.0	280	6.9	33	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	< 1.0 L	< 1.0 L	< 1.0 L	< 1.0 L	< 1.0 L
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20

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TABLE 8
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PARAMETER	UNITS	B-35 07-SEP-93 3293-002	B-35A 01-JUN-93 1670-005	B-35A 07-SEP-93 3293-003	B-36 01-JUN-93 1670-007	B-36 07-SEP-93 3293-004	B-36A 01-JUN-93 1670-006
COLOR, FIELD		YELLOW	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	1050	620	680	430	500	620
DEPTH TO WATER	FEET	13.13	10.55	13.57	10.86	13.97	11.11
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	6.8	7.0	7.1	6.3	7.0	7.1
TEMPERATURE	DEG C	14	13	12	12	13	13
TURBIDITY, FIELD		SLIGHT	NONE	NONE	SLIGHT	MODERATE	NONE
WATER ELEVATION	FEET	607.63	610.63	607.61	610.60	607.49	610.35
ALKALINITY AS CACO3	MG/L	210	330	320	230	210	330
CHLORIDE	MG/L	80	26	24	4.4	25	12
COD	MG/L						
FLUORIDE	MG/L	0.19	< 0.10	0.13	< 0.10	0.14	< 0.10
HARDNESS AS CACO3	MG/L	290	380	400	240	280	350
NITROGEN, NITRATE + NITRITE	MG/L	39	1.7	2.0	< 0.050	1.4	0.83
SOLIDS, TOTAL DISSOLVED	MG/L	770	480	460	280	350	400
SULFATE	MG/L	43	33	37	15	18	36
ARSENIC, DISSOLVED	UG/L	3.6	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BARIUM, DISSOLVED	UG/L	120	< 50	54	110	120	68
BORON, DISSOLVED	UG/L	220	< 200	< 200	< 200	< 200	< 200
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COPPER, DISSOLVED	UG/L	24	< 20	< 20	< 20	< 20	< 20
IRON, DISSOLVED	UG/L	< 100	< 100	< 100	< 100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0	< 5.0	< 5.0	< 5.0	55	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	< 1.0 L	< 1.0 L	1.0 L	2.6 L	< 1.0 L
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20

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PARAMETER	UNITS	B-36A 07-SEP-93 3293-005	B-37 07-SEP-93 3302-007	B-37A 07-SEP-93 3302-008	B-38 01-JUN-93 1670-016	B-38 07-SEP-93 3293-006	B-38A 01-JUN-93 1670-017
COLOR, FIELD		CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	620	510	770	3630	2830	2760
DEPTH TO WATER	FEET	14.18	8.13	8.14	18.53	20.19	24.87
ODOR, FIELD		NONE	NONE	NONE	NONE	NONE	NONE
PH, FIELD	SU	7.1	7.3	7.3	8.3	9.9	7.7
TEMPERATURE	DEG C	11	13	11	20	20	15
TURBIDITY, FIELD		NONE	SLIGHT	NONE	NONE	SLIGHT	NONE
WATER ELEVATION	FEET	607.51	606.69	606.69	617.29	615.63	610.96
ALKALINITY AS CACO3	MG/L	330	200	190	100	420	80
CHLORIDE	MG/L	13	6.8	11	26	24	23
COD	MG/L						
FLUORIDE	MG/L	0.14	< 0.10	< 0.10	1.8	2.6	1.1
HARDNESS AS CACO3	MG/L	390	290	410	620	21	500
NITROGEN, NITRATE + NITRITE	MG/L	0.85	1.2	< 0.050	1.7	0.29	1.6
SOLIDS, TOTAL DISSOLVED	MG/L	420	380	590	3000	2200	2300
SULFATE	MG/L	36	100	240	2600	1200	2000
ARSENIC, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	180	90	38
BARIUM, DISSOLVED	UG/L	68	< 50	< 50	110	< 50	58
BORON, DISSOLVED	UG/L	< 200	3100	7400	2500	2600	2200
CADMIUM, DISSOLVED	UG/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	68	< 10	52
COPPER, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20
IRON, DISSOLVED	UG/L	< 100	< 100	< 100	< 100	< 100	< 100
LEAD, DISSOLVED	UG/L	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0	< 5.0	55	< 5.0	< 5.0	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
SELENIUM, DISSOLVED	UG/L	< 1.0 L	< 1.0 L	< 1.0 L	57	320	22
SILVER, DISSOLVED	UG/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ZINC, DISSOLVED	UG/L	< 20	< 20	< 20	< 20	< 20	< 20

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TABLE 8
GROUNDWATER CHEMISTRY

PARAMETER	UNITS	B-38A 07-SEP-93 3293-007
COLOR, FIELD		CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	3280
DEPTH TO WATER	FEET	27.59
ODOR, FIELD		NONE
PH, FIELD	SU	9.0
TEMPERATURE	DEG C	16
TURBIDITY, FIELD		NONE
WATER ELEVATION	FEET	608.24
ALKALINITY AS CACO3	MG/L	90
CHLORIDE	MG/L	21
COD	MG/L	
FLUORIDE	MG/L	3.4
HARDNESS AS CACO3	MG/L	390
NITROGEN, NITRATE + NITRITE	MG/L	0.59
SOLIDS, TOTAL DISSOLVED	MG/L	2600
SULFATE	MG/L	1800
ARSENIC, DISSOLVED	UG/L	51
BARIUM, DISSOLVED	UG/L	54
BORON, DISSOLVED	UG/L	3300
CADMIUM, DISSOLVED	UG/L	< 0.30
CHROMIUM, DISSOLVED	UG/L	11
COPPER, DISSOLVED	UG/L	< 20
IRON, DISSOLVED	UG/L	< 100
LEAD, DISSOLVED	UG/L	< 3.0
MANGANESE, DISSOLVED	UG/L	< 5.0
MERCURY, DISSOLVED	UG/L	< 0.20
SELENIUM, DISSOLVED	UG/L	57
SILVER, DISSOLVED	UG/L	< 1.0
ZINC, DISSOLVED	UG/L	< 20

Appendix D

2016 Low-Hazard Waste Exemption Leaching Test Results – Slag and Ash

Sediment and Soil Analytical Results - Water Leach Test Results
WPL Nelson Dewey

Sample	Date	Depth (feet)	Material Type	Lab Notes	Boron (ug/L)	Calcium (ug/L)	Fluoride (mg/L)	Sulfate (mg/L)	Chloride (mg/L)
WPDES POND									
SED-1	8/3/2016	0-1.3	Fly Ash	--	240	6,100	<1.0	4.4	4.3
SED-2	8/3/2016	0-1.0	Fly Ash	--	200	5,900	<1.0	11.5	4.3
QC-3 (SED-2)	8/3/2016	0-1	Fly Ash	--	240	5,900 J	<1.0	6.1	3.5 J
SED-3	7/20/2016	0-4.5	Slag	--	130	2,200	<1.0	5	2.7 J
	7/20/2016	4.5-5.5	SP	--	<50	<500	<0.20	<2.0	2.5 J
SED-4	7/19/2016	0-4.8	ML	--	510	4,100	<10.0	11.9 J	10.5 J
	7/19/2016	4.8-5.5		--	74 J	NA	NA	NA	NA
GP-19	8/4/2016	8-12	SM	--	62 J	<500	<1.0	2 J	2.4 J
SLAG POND									
SED-5	7/20/2016	0-1.6	ML-OL	--	54 J	18,200	<1.0	33.3	3.2 J
SED-6	7/20/2016	0-1.0	ML	--	60 J	17,500	0.36 J	59.1	3.7 J
SED-7	8/4/2016	0-3.0	Fly Ash	--	88 J	11,300	<1.0	10.5	4
SED-8	8/4/2016	1.0-1.5	Fly Ash	--	82 J	11,400	<1.0	12.1	3.7 J
COAL YARD									
TP-CY-1	7/19/2016	0-0.5	Coal	--	140	<500	<2.0	<20.0	<20.0
	7/19/2016	3.0-3.5	SM	--	100 J	<500	<1.0	<2.0	2.8 J
TP-CY-3	7/20/2016	1.9-2.1	GM	--	<50	7,600	<0.20	2.8 J	3.9 J
	7/20/2016	4.8-5.5	SM	--	NA	NA	NA	NA	NA
TP-CY-4	7/19/2016	0-2.8	Coal	--	190	<500	<2.0	<20.0	<20.0
	7/19/2016	2.8-3.2	GP & SM	--	<50	4,500	<1.0	<10.0	<10.0
	7/19/2016	3.6-4.8	Slag	--	<50	<500	<2.0	<20.0	<20.0
	7/19/2016	4.8-5.0		--	NA	NA	NA	NA	NA
TP-CY-6	7/19/2016	0-0.5	Coal	--	190	<500	<2.0	<20.0	<20.0
	7/19/2016	0.7-1.0	SP	--	<50	2,600	<0.20	2.3 J	2.5 J
TP-CY-10	7/19/2016	0-0.5	Coal	--	120	<25	<1.0	11.6	2.4 J
	7/19/2016	1.0-2.0	SM	--	<50	2,000	<1.0	2.3 J	2.2 J
	7/19/2016	6.5-7.0	SP	--	NA	NA	NA	NA	NA
TP-CY-12	7/20/2016	0-0.3	Coal	--	160	<500	<2.0	<20.0	<20.0
	7/20/2016	0.3-2.0	SP	--	<50	2,600	<0.20	2.2 J	2.2 J
	7/20/2016	2.0-2.7	SP	--	<50	700 J	<0.20	27.5	2.3 J
QC-1 (TP-CY-12)	7/20/2016	0.3-2.0	SP	--	<50	11,000	<0.20	2.5 J	2.6 J
SLAG HANDLING AREA									
GP-5	8/3/2016	12.5-15	Fly Ash	--	100	3,000	<1.0	3.0 J	<2.0
	8/3/2016	18-24	ML & SM	--	99 J	2,300	<1.0	<2.0	3.3 J
GP-7	8/3/2016	7.5-18	Slag	--	<50	720 J	<1.0	<2.0	2.2 J
QC-2 (GP-7)	8/3/2016	7.5-18	Slag	--	<50	710 J	<1.0	<2.0	2.2 J
GP-14	8/4/2016	12.5-15	Fly Ash	--	120	25,200	<1.0	13.4	<2.0

Sediment and Soil Analytical Results - Water Leach Test Results
WPL Nelson Dewey

Sample	Date	Depth (feet)	Material Type	Lab Notes	Boron (ug/L)	Calcium (ug/L)	Fluoride (mg/L)	Sulfate (mg/L)	Chloride (mg/L)
SLAG SAMPLES[1]									
Slag 01 [2]	6/3/2013	--	Slag	--	NA	NA	NA	NA	NA
Slag 01	12/23/2013	--	Slag	--	12.5 A B	1,240	NA	0.218	0.277 B
NED Slag Composite 2014	7/1/2014	--	Slag	--	11.7 AB*^	879 A	NA	0.457 B	< 0.142
Slag Sample	4/14/2015	--	Slag	--	< 1020 A	1,140 A	NA	0.427	0.751
FLY ASH SAMPLES[1]									
NED Flyash Composite [2]	2/14/2014	--	Fly Ash	--	NA	NA	NA	6,530 B	NA
Week of 062815 [2]	7/3/2015	--	Fly Ash	--	NA	NA	NA	6,260	NA
Week of 010916	1/4/2016	--	Fly Ash	--	NA	NA	NA	NA	NA
NR 140 Preventive Action Limits (PALs)					200	NE	0.8	125	125
NR 140 Enforcement Standards (ESs)					1,000	NE	4	250	250
40 CFR Part 141.62 Maximum Contaminant Levels (MCL)					NE	NE	4	NE	NE
NR 538 Table 1A Standards					190	NE	0.8	125	125
NR 538 Table 2A Standards					1,900	NE	8	1,250	1,250

Abbreviations:
ug/L = micrograms per liter
mg/L = milligrams per liter
NE = No Standard Established
ML-CL = Silty Clay
SM = Silty Sand
ML = Silt

Notes:
1. Slag and Fly Ash samples were collected by the plant as part of permit requirements.
2. Sample was analyzed using the SPLP Leach Method rather than the ASTM Water Leach Method for tested parameters except for Sulfate.
NR 140 ESs - Wisconsin Administrative Code (WAC), Chapter NR 140.10 Table 1 - Public Health Groundwater Quality Standards from July 2015 and WAC, Chapter NR 140.12 Table 2 - Public Welfare Groundwater Quality Standards from July 2015.
NR 140 PALs - WAC, Chapter NR 140.10 Table 1 - Public Health Groundwater Quality Standards from July 2015 and WAC, Chapter NR 140.12 Table 2 - Public Welfare Groundwater Quality Standards from July 2015.

Laboratory Notes/Qualifiers:
J = Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
A = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B = Compound was found in the blank and sample.
F1 = MS and/or MSD Recovery is outside acceptance limits.
H = Sample was prepped or analyzed beyond the specified holding time.
^ = ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
* = LCS or LCSD is outside acceptance limits.

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Checked by: BSS Date: 10/24/2016
Original table prepared for Slag Pond Closure Low Hazard Waste Exemption Request (SCS Project #25216054.00).
Reformatted for the Alternative Source Demonstration to include only the parameters with SSIs that were included in the leach testing by SCC, 4/13/18.

I:\25219071.00\Deliverables\2019 April ASD NED\Appendix C - 2017 leachate results slag and ash\[Table 4. Sediment_Soil_Water Leach Results_SSIParameters.xlsx]Leach Test - SSI Parameters